

T H E
Natural History
O F T H E
Chalybeat and Purging Waters
O F
ENGLAND.

With their particular
ESSAYS and USES.

Among which are treated at large
T H E
Apoplexy & Hypochondriacism.

To which are added,
Some Observations on the Bath
Waters in *Somersetshire.*

Dedicated to the Right Honourable the
Earl of *Manchester.*

By *Benjamin Allen*, Med. Bac.

L O N D O N

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Natural History

of the

Islands



Apology

To the

Some

Dedicated

By

LONDON

174

TO THE
Right Honourable
CHARLES
Earl of *Manchester*,
Baron of *Kimbolton*,
Lord *Mandevill*,

AND
One of His Majesty's Most
Honourable Privy Council.

My Lord,

THAT this Treatise waited
for a share in the Cere-
mony of receiving your Lordship
A 2 7 from

The Epistle Dedicatory

from *Venice*, Arguments are not wanting; for besides the Interest that I bear by living within your Influence, There is a common Obligation to appear in the general Train of those that gratefully attend your Return from your Embassy, from a just Sense of the Blessings these Kingdoms receive from your Employment, and your Country by your Return and Presence. But that I inscribe it to your Lordship's Name, I am more necessarily induced, in that it is not easie to find so fit a Patron and so great a Judge: Your Greatness that impowers you to countenance a Book, hath a Brightness more than common to your own Quality, and hath all the Worth and Beauty,

The Epistle Dedicatory.

Beauty, that Integrity, Virtue and Goodness can give it. As a Judge how you are Qualify'd, I shall not attempt; but only observe your Lordships excellent Temper to be so great a Help, as that just Notions of things are not to be had without. As a Character is better waved, Justice being seldom done in Dedications; so I am happy that it is not the least part of your Character, that your Excellencies have a Foundation above that of common Applause. However you need it not, I had the Honour to observe your Lordships first Years, possess'd of the Esteem of one who had a Fame for Learning, among those that are acknowledged to be the greatest

The Epistle Dedicatory.

Masters of it in *Europe*; and now
your Riper ones in the nearest
Employment of the greatest of
Princes.

The Subject, My Lord, gives
you a Right to it; who accounts
the noblest Subject is to know a
Man's self, and who makes the
Practise of doing Good your Plea-
sure: And the Touches I have
given at Humane Nature, your
Lordship's several Travels abroad
have given you a particular Pa-
late for. I have offer'd somewhat
at the two grand Problems, the
Mechanism of Life, and Use of
Respiration, and at the Distinct
Notion of Humane Nature. But
I own the Thoughts are shatter'd,
and not exact, What your Good
Opinion

The Epistle Dedicatory.

Opinion Supports ; I shall set
above the Rate of common Esti-
mation ; so what your Judgment
condemns, shall lose all Value and
Concern with me : However it
gives me an Opportunity to sig-
nifie, that I am,

My Lord,

Your Honours Most Humble

and Devoted Servant

Benjamin Allen.

T H E

The Right Honorable
Opinion supports, I shall be
above the Rule of common
usage; to what your Judgment
concerns, that I will not
Concurre with me; I shall be
gives me an Opportunity to
state, that I am

My Lord
Your Honor's Most Obedient
and Devoted Servant

James Oglethorpe
1734

T H E P R E F A C E.

THE Knowledge of the Specifick Seat, and Nature of the Disease, and Energy of the Remedy, as it gave the Rise and Increase to Medicine, so is what the Art of Physick consists in, and its Excellency depends on. This is evident in ~~the~~ *Jaundies*, and appears in every Disease and every Remedy; The *Jaundies* are known to Physicians so admit of a various Cure, as Trouble, Obstruction of the *Catamenia*, Fevers, or an Indisposition of the Intestines may produce them. The Exactness requisite to this, is further seen in the ill Success that attends the empirical Use of the Cortex in *Pibises* and Fevers, without distinction of the Nature of the Symptom, and Propriety of the Medicine. How far the best Methodists fall short, that sit down short of this Inquiry, is experienced in Fevers, wherein, the taking Indications indiscriminately, without respect to the Nature of the Cause, could never be made consistent with success, by the most judicious and happy Practicer which that Method hath yet produced.

The present Subject is one of the noblest in Physick, not only for its Generosity and Universality, but for their extraordinary Virtue in some, and those very many and various Diseases, wherein they are the most constant and sole Remedy: And that those Waters are liable to the same Inconvenience,

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nience, I have been induc'd to believe, by their frequently ineffectual and improper Use, and the Neglect of so certain a Remedy, which I have observ'd in some Diseases, wherein the Patients must be suppos'd to have dropp'd for want of them: Instances of which I shall have occasion to glance at presently. I shall therefore make no Apology for my advancing somewhat towards so great a Desideratum. As to what hath been done on this Subject, by the Inquiries which some of our greatest Naturalists who have engag'd themselves in it have made, I need only say, that neither their Principles have been discover'd, nor the Nature of the Salt or Spirit of each Water have been distinctly examin'd, whereby as they have been wide from error, so they advanced only loose Conjectures at some unknown Principle; the most particular Inquiry by the very accomplish'd Physician and industrious Naturalist Dr. Martin Lister, to whom the World is oblig'd for what he hath publish'd, and myself what he was pleas'd civilly to communicate to me, of the Condition of the Scarborough Spring, takes notice of the Condition of the Wells so far, as to observe the Efflorescence of their Earth, and their ferreous Stagn, which he observes to be an attendant on all our Mineral Springs and Baths, as I remember without distinction, and tho' rightly judging the Salt a Native of the Soyl where it is found, yet on the same Account neither arriv'd at the Nature of the Principles of this Salt, nor its differences, nor trac'd its reason and Derivation. The Chalybeate Waters which were reducible to a few general Heads,

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Heads, I have given only Samples of, to both I have preserved their experienced Virtues, and to the Purging ones, suggested some from their Nature; and in this Account I find one Benefit that results, that besides helping to the distinct Nature of each Water, I have discover'd, or at least made useful, some Water's of the same Virtues with the justly celebrated ones, whose distance made them still wanting to other parts of the Kingdom, as those of Scarborough and Knatesborow are. My account of the reason of the Operation of the Waters, is so wild and imperfect, as to be nauseous to my self, and afford me no other satisfaction, than that I have hinted what ought to be done; yet because an insight into this, promotes the understanding of the Nature of the Diseases, and in what their Cure must consist, and so the true place of the Use of the Waters; the Hints I give being somewhat informing, instead of troubling the Reader with the Reasons of so great Negligence, I shall choose to induce him to forgive it, by giving them a little light here, that may a little clear my sense in this matter. Both the Chalybeate and Purging Waters have some Virtues in common to restore the Appetite, remove nausea, pains of the Stomach, Pains of the Head, to cool, to allay Flatulencies, and the Cramps and disorderly Motions in the Body, and flatulency of the Spirits that attends them. And this the Nature of the Principles well accounts, which are thus far the same; for as Water, the common Vehicle in both, demands Consideration, as being most unfermentative, and so a great assistant in suppressing Flatulencies

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lencies from ill Concoction, and other Failings of the parts occasion'd by fermented Liquors; so the main Principle of the Purging Waters, I have detected to be a Chalybeat Juice. These Waters, where they can reach and pass, and suit by their grossness, seem to answer the Specifick Nature of the Chalybeat in some measure. On this account these sometimes succeed in the Cure of a Diabetes, as my honoured Friend, and learned and compleat Physician, Dr. Clopton Havers inform'd me, upon a Case I consulted him in; and as the Learned Dr. Grew hath recommended them; which is the peculiar Province of the light Chalybeat ones, as being a Disease of the Glands, which else these are unserviceable in. The Purging Waters by their grossness, have therefore their Effect chiefly on the Viscera and first ways, which their Salt qualifies them to cleanse and exterminate. Thus they are found to cure Head-achs, Vertigo's, Cramps, Colicks, and the Jaundies, when their Cause or Fomes is in the Stomach or Bowels, or is Hypochondriacal. They are suited to the Diseases likewise that attend the grand Climacterick, as I call that of 49, by joyning, correcting and exterminating the Faces of the Chyle, which then is grosser and more Altholifate and wants discharge: As to differences of the Salts of these Waters, as well of the heavy Chalybeats, experience made them of weight with me; having, beside what I mention in its place, observed the Jaundies cur'd more generally by those whose Salt was affine to common Salt, and that elder Persons receiv'd most Benefit from those that were Chalybeat, and that the particular Con-
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Attention requir'd a distinct regard to the Salt: Of what power unheeded differences of Salts are in our Bodies, besides experience, I found it so reasonable, in that *Vitrioline*, and common Salt, and Niters, precipitate each other, that it farther proved itself by the successful use this directed me to make of it in Fluxes of Blood, immoderate Flux of the Catamenia, and some other Diseases of this Year, which by many reasons I judged to be Nitrous, wherein I found Chalybeate Preparations to be the only effectual Remedies, which were so unlikely, as commonly in the Chlorosis promoting such a Flux, that I found it pretty hard to persuade some to the use of it. And the proper use of the more Acid Chalybeate Waters in Fluxes of Blood make them a peculiar. The Virtues of those and the Astringents, appear in their place. The last of these are least efficacious and most numerous, the Instances of that at Leez Place, and at the much honoured Sir Edward Southcott Bar. his Seat, are sufficient for Examples. The light Chalybeates are the most abstracted of this kind, and so fit to the Recesses of Nature which the others cannot reach, and to shew the power of the Mineral. The Virtues of these in various affects of Body and Mind, and Hypochondriacism which produceth them are constant: The Diseases are so odd which these and only these do cure, that they ought to be specified, and shall be done under these Heads; The first drawn from the part affected, which is the Glands, and this Rule is so extensive, as to hold in all Diseases of the Kidneys, and Glands of the Joyns. Their happy use in the first, I

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receiv'd Information of from the before mentioned Dr. Havers, which I found confirmed by this surprising Effect upon their very first taking, that, instead of passing, they stop'd their Urin, which was little to be expected from so powerful a Diuretick as they else are found to be: And the perfect Cures of the Gout by these Waters are frequent, and have been well attested to me. A second Mark or Head, The Diseases they are Specifick in, is characterised by the Nature of the Waters, and Diseases they Cure, as the Waters clear, depurate and suppress exorbitant Fermentations, and as Diseases are produced by the Luxury of the Peculency of the Chyle, and effort of fermented Liquors, among which are the Diabetes and the Gout, which are often produced by the use of fermented Liquors, which by how much the staler the Beer is, the more sure the Mischiefs, and are incurable, without altering the Drink in great measure: To which I may add, that the Gout is said never to have assailed any Drinker of Water; and many Indispositions are under this Head, which are thus pointed at by the Cause. A third Consideration that points at the Cases these Waters are proper in, is the Occasion and time of the Disease, and brings in all the Diseases at the Climatrick. A fourth regards the Spring and part of its Origine, which is the Brain and Mind, and indicates all Diseases of any kind, produced by Trouble and Grief. The Cure of the Fistula and Fevers may make other Heads, and give a rise to greatly improveable Thoughts. Now in order to the just and ready use
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of these Waters, that promptuary of Experience can only be certain that nicely digests Observations, and specifies the Cases; this only can readily point out the Remedy, and hinder their improper Administration, and discover Cases wherein they are effectual, which may be so remote to our Sense of them, as never would encourage our attempting the Application of the only proper Remedy. And this I insist on the more, because I have had reason to believe, this escape to have been even from the generality of Physicians. This may be particularly instanced in a Dropsie, wherein the Waters are very improper, and often hasten the end of the Patient; and yet in the same Disease, when it proceeds from grief of Mind, they are a reasonably certain, and the only Remedy; I say in this I have more than once known a Patient dye under the fruitless Application of a regular Course of Physick; for a Dropsie, when the successful use of the Waters in the same case oblig'd me to conclude the ill Success to be owing to the want of distinguishing the Disease, and knowing the proper Remedy, next under that Providence that disposed the Concealment: Besides Diseases from this Cause are irregular and various, and not bear any other method of Discovery or Cure. Distempers of the Climactericks are as numerous, and their Cure seems to depend as much on the same Discovery; and I have often seen Consumptions at 21 and 49 cur'd by the dexterous Application of Chalybeats, the Waters chiefly in the Cure of which by common Methods and Intentions their Physicians had labour'd unsuccessfully: And as this helps us to the

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Knowledge and Cure of many Diseases that else lye conceal'd from us, so it assists our Judgment in making due and true Prognosticks; And I have been pleas'd with the evidence of Art, when I could not readily cure a Disease, viz. an Epilepsie that came on at 27 in the true Prediction of its declining and departure at 30; and of the Diseases that assaaulted at 14, superceded at 18.

The Apoplexy which is cured by the more acid Chalybeats, and reliev'd by the light ones, transcends the common Notions of the other glandular Diseases, as it is an Affection of the very Root of Life it self, and requires a particular Consideration in order to inform us how and where this Remedy is proper; for although it is evident, that it is an Affection of the medullary part of the Brain, whence Sense and Life is distributed; yet with submission to better Judgment, I conceive the Accounts of this Disease are at a loss about the Production of it, when they come to the immediate Cause, and the long Recursion this Enquiry demands, as it is unavoidable, so is so seasonable also, by reason of the Increase and Frequency of this Disease here especially in the Country, where this Year it has insulted more than ever, that I question not but the Acceptableness of the Disquisition will excuse it. I shall distinctly view the Nature of an Apoplexy, and Disposition it consists in; The Causes of it; The Differences; and lastly, The suitable Intensions and Indications. The general Phenomenon upon Dissection of those that dye of this Distemper, being an Effusion of Blood upon the Brain, Authors
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do generally agree in placing the Production of this Disease, in an Obstruction made at the Brain, and must be allow'd to be produced in the Cortical part, and conceive this to be made by some Congestion in the Blood-Vessels, and which the Learned Dr. Cole supposes may be of viscous or serous Matter, as it is either in quantity, or freshly excited, or else Polypous Concretions, or any other obstructing Matter, to admit which, the Brain is pre-dispos'd by its Laxity or Opiness; in which likewise, the bare Distention of the Arteries may suffice to produce it. I shall with all Defiance to those great Authors, and particularly the last, humbly offer my Conception, though more grossly, yet as it appears to me, and best explains the Benefit of the Mineral Waters in this Case, thus, That an Apoplexy is a Disease of the Cortex cerebri, not founded in any Obstruction, though often attended by them, but consisting in the Ruin of its mechanical Crasis and Temper, which is such as Steel restores, and Nitics destroy, the Cause and Nature of which, is common to other Glands, and produceth a Paroxysm, by a Hemorrhage or Admission of Flatulent Parts consequential to this; which Distemper the Suicus nutritius may arrive at, either by Age or Qualities contracted upon Congestion, and grossness of the Chyle, or receive by Particles communicated from the Air, or all jointly; besides violent Causes, and so may truly be said to be seated not in the Sanguinary Vessels, but Glandular Ducts. But as they wrongfully charge the Blood-Vessels with the cause, in that an Apoplexy may be produced without any
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of this, as is clear from Dr. Willis's Instance; so they seem incumbered in the explaining the Reason of the Abolition of Sense and Motion; and in the place and nature of this Congestion; the Mistakes in the Nature of this Distemper, seem to me to be owing to the ill Notion of Animal Mechanism, and use of the Brain, wherein they suppose a Circulation or passage of Animal Spirits, so necessary to Life, as that the Interruption of them suffices to abolish it. The Difficulties of which way of Solution, are taken notice of by all the Writers on this Subject, rather than explain'd. My Sense in this Matter I shall give, by considering, first, the Inconveniences the Brain can suffer without this Deprivation. 2ly, The Vital Mechanism of the Brain: And 3ly, The necessary Cause or Reason of its Production, as appears in the Brain. And to be brief, first, it appears from the Dissections in Wepfer, Willis, and others, that all the passes of the Animal Spirits, at once, cannot be obstructed; nor a Compression of the Brain and Cerebrum, nor an Inflammation of the Brain, or its Meninges, produce it; there are as just Exceptions by against plenty of Blood; nor is it from Sæm's generated, undissolving Serum may be without it, and Water heap'd within the Cranium and Ventricles. And Plater's Instance proves, that a Carcass, Schirrhous and Fungous Tumour on the Corpus Callosum, produced Stupidity and Death without an Apoplexy. 2ly, I shall consider the grand Design of the Brain, and its vital Mechanism, of which, though it be inextricable in its private and more recondite

Motions,

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Motion, yet thus much appears: Although Animal Mechanism is compound, and Respiration is necessary to the Motion of the Blood, so which the Lungs are accordingly fram'd, and upon which Motion Life depends; yet as the Pulse of the Heart is perform'd by the Nerves, so the Air Atmospheric, upon whose obstructing or fixing, so as to hinder its Elasticity, Life so suddenly ceaseth in some Animals, seems to act only on the Nerves, as in those that have membranous Lungs, where no more Blood circulates in their Lungs, than is necessary for the supply of the part; whereby the Air seems to serve the Circulation in other Animals, for greater force and greater Heat; for these Animals first nam'd, are colder, and live long without Food, and so both Air, and the Niter of it, is useful with equal Power, and in equal Degree, to the Motion necessary at the Lungs, to the fury of the Circulation of the Blood, and to the Nourishment to be consum'd; and it is observable, that the Par vagum and intercostal Nerves, which are the Instruments of involuntary Motion, serve both Lungs and Ventricle. The use then of this Heat in the Blood, seems to prepare a due Elasticity in the Chyle, that is, to serve the Brain or parts of it, be it the Spirituous part in what sense soever, being accommodated to some Disposition of the Brain; for in the external Air there is, besides all this (but answerable to this) a due degree of Elasticity, or quantity of elastick parts; or compressure of them necessary to Life, which is proportion'd to the coldness of the Animal perhaps, but certainly adapted

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to the Spring of Life in the Brain, as is seen in Fish which live by the Air, yet dye in the open Air; and is confirm'd in Whittings which swim deep in the Water, and so with us are not liable to be taken by Nets, and dye instantly upon being taken out of it. The Brains of Animals are accordingly adapted to this use, those who use the greatest force of the Air, as Birds, have the Cortical part vastly larger in proportion than men, no doubt to separate the Air, and perhaps corroborate the Brain, and their Lungs fix'd accordingly; and Fish have least Brain and Cortex too. The Nature of Life, and use of the Brain, being thus stated to consist in the justice of a Spring; it is easy to conceive, that the enlarging of the Elasticity in the Brain, as well as without, is enough to destroy the Mechanism of Life. Now though we know not the work of this within the Brain, yet it is difficult to believe, and not agreeable to Experience, to allow any other cause that deprives Life so suddenly as some elastick parts, that can communicate too large a Degree or Scope to it, which the Blood conveyeing so much Air may easily do, which the difficulty of Respiration thereon depending evidences. By this alone may we understand, to account for the appearances of the disorders of the Brain upon Dissection, which now come to be consider'd: As this will reach and account for those Apoplexies that shew no Stoppage, nor Irruption at the Brain, as those of old Age, and gives a reason why they attend the Old and not the Young: So we shall find those Instances

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stances wherein the Brain is forced by the Blood, confirm this account. It is observable from the Dissections of all, that the confirm'd Apoplexy is produced by the Effusion of Blood at the Basis of the Brain out of the Carotid Artery, especially the anterior Branches of it, and at which place all that have time complain: And though generally the Effusion of Blood is large on this occasion, yet it is observable to my purpose, that the breaking in of the Blood only on one side should take away Life; and which is more, that the quantity of two Spoonfulls of Blood at the Base of the Brain should as well affect it; in both which Instances or cases, the Effusion supposing a Stoppage of the Spirits, could not so soon have produced it. And as the last named Case of Fernelius came upon a stroke on the Eye, so the like hath happen'd on a stroke on the Neck by a fall, in that History of Wepfer.

And although this Consideration of the Vital Spring in the Brain, doth not exclude other ways by which it may suffer, beside the giving it too much Scope, which I here assign, yet I see no reason to entertain any other, since other Causes are either impossible, or not constantly produce this Disease; and since (excepting the Case of old Age, which requires a distinct Explication) it is ever produced by a Rupture of the Vessels, as an imperfect one by admission only of unfit and rapid but small parts. Again, to proceed further in the Inquiry into the Nature of this Disease, by informing our selves how this Rupture comes to pass,

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we are to consider, that it appears that the Condition the Blood-vessels receive, by the Stoppage of the Canal by the grosser Blood, or accidental hardness or closure of it barely consider'd by nature, are render'd ineffectual to be the occasion of this Disorder; the reason therefore of it, is to be had without, as the Vessels may be jointly respected or affected where they are more minute. The Nature of this is to be sought from what the Compages and Affection of the parts afford: Now how truly the Brain, understood as a Gland, accounts for this, must be prov'd by the Disorders those Bodies suffer, and the Analogy they bear to each other. That the Affections are common, is evident from the Calculi, Varicose Knots and Hydroids, found in Apoplethick Brains at the Secretions, as at the Plexus Choroides. The justness and genuineness of this account, appears farther in the part and cause of this Disease, in that the Rupture is made principally at the anterior Branches of the Carotid Arteries nearer the Origin of the Brain, where accordingly those that are seiz'd complain; and that the ruptur'd Vessels are those that have gone a Compass, and descend from the Anfractus of the Brain. The reason of this last, is to be understood by the Observations of Bellini and Malpighius, who inform that the Winding of Glandular Vessels, and so of the Anfractus of the Brain, is to give the Blood time to stop and separate through the Glandular Pores. And at this solves the Reason partly, why the Rupture is not, where the Blood comes, with greater force;

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So the Imbecility of the part hath hence a Reason, and points at the occasion of it, in that it is where the greater part in proportion of the Chyle, or nutritious Juice, must therefore be deposited, which when weigh'd together, with the Consideration that the Error of the Chyle induceth all Diseases, and allows the Effects of the Air, and that the Fit so often seizes after full Meals, and that this Disease keeps pace with the Affectio Hypochondriaca, if not increas'd in time together with it; and that its so often being induced by trouble of Mind, evidences the same analogous Cause and Reason, are natural, and to me convincing Arguments. How this Rupture of the Arteries comes upon an Obstruction or heaping of Chylous parts in the Glands, comes next to be examin'd: It is observ'd by Wepfer, in his second Dissection, that the Brain there was much intenerated, where the Effusion of Blood was made; but whether the Laxity of the Brain, or Openness of the Pores, of the Tabuli, or Siphons, that receive the Chylous part of the Blood, render the Brain liable to this Irruption, is questionable and not to be answered; so provided we know the Nature of the Parts that occasion this, is not material. I own the Uses of the Blood in joyn't-service with the Nervous parts to be another Inquiry. The Delatoriness of the Glands, when obstructed in producing a Rupture of the Blood-vessels, be it in the Jaundies, Asthma, or Dropsie, and the liableness of the Glands to alteration, especially upon exclusion of new saline parts.

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we are to consider, that it appears that the Condition the Blood-vessels receive, by the Stoppage of the Canal by the grumous Blood, or accidental hardness or closure of it barely consider'd by nature, are render'd ineffectual to be the occasion of this Disorder; the reason therefore of it, is to be had without, as the Vessels may be jointly respected or affected where they are more intimate. The Nature of this is to be sought from what the Compages and Affection of the parts afford: Now how truly the Brain, understood as a Gland, accounts for this, must be prov'd by the Disorders these Bodies suffer, and the Analogy they bear to each other. That the Affections are common, is evident from the Calculi, Varicose Knots and Hydatides, found in Apoplectick Brains at the Secretions, as at the Plexus Choroides. The justness and genuineness of this account, appears farther in the part and cause of this Disease, in that the Rupture is made principally at the anterior Branches of the Carotid Arteries nearer the Origin of the Brain, where accordingly those that are seiz'd complain, and that the ruptur'd Vessels are those that have gone a Compass, and descend from the Anfractus of the Brain. The reason of this last, is to be understood by the Observations of Bellini and Malpighius, who inform that the Winding of Glandular Vessels, and so of the Anfractus of the Brain, is to give the Blood time to stop and separate through the Glandular Pores. And at this solves the Reason partly, why the Rupture is not, where the Blood comes, with greater force;

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so the Imbecility of the part hath hence a Reason, and points at the occasion of it, in that it is where the greater part in proportion of the Chyle, or nutritious Juice, must therefore be deposited, which when weigh'd together, with the Consideration that the Error of the Chyle induceth all Diseases, and allows the Effects of the Air, and that the Fit so often seizes after full Meals, and that this Disease keeps pace with the Affectio Hypochondriaca, if not increas'd in time together with it; and that its so often being induced by trouble of Mind, evidences the same analogous Cause and Reason, are natural, and to me convincing Arguments. How this Rupture of the Arteries comes upon an Obstruction or heaping of Chylous parts in the Glands, comes next to be examin'd: It is observ'd by Wepfer, in his second Dissection, that the Brain there was much intemperated, where the Effusion of Blood was made; but whether the Laxity of the Brain, or Opacness of the Pores, of the Tabuli, or Siphons, that receive the Chylous part of the Blood, render the Brain liable to this Irruption, is questionable and not to be answered; so provided we know the Nature of the Parts that occasion this, is not material. I own the Uses of the Blood in joynt-service with the Nervous parts to be another Inquiry. The Delatoriness of the Glands, when obstructed in producing a Rupture of the Blood-vessels, be it in the Jaundies, Asthma, or Dropsie, and the liableness of the Glands to alteration, especially upon exclusion of new saline parts.

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parts from the Blood, to preserve as well as supply them, induce me to believe much herein to be owing to some Quality they may conceive, if ne sufficient to corrode the Artery, at least to destroy their own Crasis. Accordingly I shall now consider the Cause without us, that induceth this Disposition to this Disease, as sufficient to direct us, which is the Air. Though I have some Reasons that draw me to an Opinion, that the Particles which compose, or are bore in our Atmosphere which variously affect our Bodies, are so gross, as to allow a Conception of their operating, on the score that they are Effluvia, either of the constant or new produced Bodies in the Earth, but owe their Energy to some Quality depending on the various Figure or Disposition, or other alteration they are liable to receive in the Atmosphere: Yet not to argue from so questionable Principles, I shall rather endeavour to demonstrate the Nature of the parts of it by their effect, and as they appear the occasion of this Disease. And this Distemper making so extraordinary insults at particular times, it is reasonable to examine the Disposition of the Air, whereon depended the Increase of the Disease, and wherein it consists. The grand increase of it upon the great Frost 1683, appearing sufficiently by the Bills of Mortality, lead the Learned Dr. Cole to do so good Service to this Inquiry as to observe it, and makes it a Phenomenon, the Solution of which is no small Direction. But as I think the Constipation or Obstruction made by Admission

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admission of the Nitrous Particles not satisfactorily, without accounting for the new Capacity they have obtain'd beyond what they have in other Frosts, and the Difficulties of admitting them; so it seems evident to me, that the rise of this Disease or first increase is of a longer date. And to offer my sense of this matter, the Apoplexy seems to me to be one of the fix'd temporary Diseases, which as they resist not from the immediate Change of Season and Weather, so are rooted in some more subtle parts of the Air, which Weather and Season may assist by giving them a liberty of exerting themselves, and likewise a supply. And because I never yet observ'd any sudden leaps or disorder, though I nicely observ'd the Air as I could, made in the Production of new Diseases; I was ready to judge from the rise of this at the declension of the Rickets, that the actors of both were parts of equal subtilty, and not much differing in Nature. And I confess the Experiment of the Marbles seem to favour a Nation, that there is differing degrees of Subtilty in our Atmosphere itself, and so in the parts lodg'd in it. I shall not attempt determining, though there is great reason to believe the matter to be Nitrous by its Effect, and its Cure. The Reason of this Disease, and Nature of the Condition of the Air producing it, is probably more clearly to be seen in the Observation of the particular times of the grand Efforts of the Air in producing it; in which we ought to observe

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observe the general Effects of the Air on all Bodies, and carry on the Inquiry by the Effects and Power it exercises on animal ones. And because this evidence or detection of the parts affecting is liable to exception, that differing Diseases are produced often at once by differing parts or different qualities in the operating Body, and especially in so mixed a one. And again, as the more subtil cause is unknown, so if we discover the Particles of the Air, or disposition of it, that contriveth the cure, we have small advantage. I must observe, that I am of Opinion, that the Nature of the Air, and the Disposition of it, to which Diseases owe their rise, are more discoverable, than they at first thought give hopes of, and that in so great a measure, as to make the Knowledge serviceable to the cure of Diseases. And my Reason, I think, will be vouch'd in my Opinion, that will take the trouble of tracing Diseases in conjunction with the Air and Seasons, for the Difficulties are in great measure sol'd, by barely distinguishing between the Diseases produced by single Seasons, and observing the constant remembrance of the Humour or diseasymatter, and how it receives alterations from variety of Seasons, and that as the place of the Disease is partly or chiefly owing to the first, so the Nature is the last of these.

That the present case depends on these evident Causes, may reasonably be concluded, not only from the increase of it jointly with these, but also
that

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that it traced in its containing and procreantick Causes, which require no more to explain, than what the common effects of the Air in other Diseases exhibit, and the nature of the Air thus consider'd accounts for. The first time to be consider'd, and which assists us in the discovery of the Cause of this Distemper from the occasion of its Increase extraordinary, is the great Frost. To avoid prolixity, I shall only observe, that as that can never determine the matter to the Brain, nor account for the increase of this Disease as so great a distance, and is contradicted by experience; so the incidence of such a Season may give a lift to this Disease, on other Considerations than the conveying of the Frosty and grosser nitrous parts, and that may be of more subtils or distinct Parts, that may be contain'd or mix'd with them, that may better account for this Phenomenon, which must be suppos'd to be vastly supply'd by so great a Frost, which may be allow'd either to feed the more subtils, or increase them by the Precipitation and Congestion of the Parts they bring, and separate and leave. Indeed the grand Continuation of the Increase, makes this Deduction necessary, both of its Subtlety and Nature. The last of these must most disclose it self at the time of its abounding in the highest degree, and this must be fix'd at this present Year 1698, the reason of which I shall now examine; that I rightly fix the Inundation and Exorbitancy of the invading Matter on this, or this and the last Year, I need not endeavour to convince, being so extraordinary;

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inary, as that the like number of Apopleticks were never yet observ'd in this or past Ages; and indeed by the generality of the Vertigo's that have invaded, which must be refer'd to the same assault, may be said truly to be Epidemical. That the matter concern'd in this is nothing obscure, or besides what is evident and obvious appears, in that first the other Distempers raging at the same time were uniform, and differ'd only in place, the matter of which is plainly enough Nitron, but particularly (because the Nature of them differs) its Qualities consist in Acidity, such as will not preserve from but promote Putridness, Subtility to penetrate, and Liquibility to flow with the Juices, which Qualities appear easily in the Effects in both the Chronical and Acute Diseases of these Years last past: It much illustrates this account, to observe the steps made in the producing this general Disposition in the Air, which I must here but touch at, without explaining. It is very notable that a Glandular Acidity attended the Diseases in 94; Epilepsies in Children, and Nervous Rheumatism in the Grown, advanced with the great Measles in 95, both seated in the Membranes and at the Head. In 96 remarkable for sudden Changes of Heat and Cold, rag'd Epilepsies, Vertigo's, and lax Tumours and Ulcers of the Throat, that came as Colds. Through the Subtility and Increase of this matter, which seem'd fitted to weaken the containing parts (the unseasonableness of the preceding Year reasonably assisting) it obtain'd admittance at the latter end of the Year

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Year (which was wet and windy) to the Interior Glands, as I call those that serve Life it self. And now appears an odd Distemper, that seiz'd with Faintness, and Inquitude, and Deliquiums, and a yellowness of the Skin, and dry Cough. Upon Dissection of one of these Bodies, I discover'd a reclused Abscess in the Lungs, invested with a tough Coat, and containing thick Pus, without any opening external, or into the Bronchiae, but was fed by a small Duct from the largest Gland of the Lungs, which Gland was grumous, and look'd and felt like powder'd Chalk. The Pancreas was in the same state, which occasion'd the yellowness as I conceive, and the Thymus emaciated. And by this insight I cured others of the same Disease by Emulsions of Alkalis, first to remove the acidity, and then by a Sudorific Decoctum amarum, and closing the Course with Chalybeats. At the very same time Apoplexies insuded in a strange degree, and Colds affecting the Head: These all held in 97, which ending in a long and gentle Frost, upon this in 98. This Disease became Epidemick, in that it seiz'd so frequent, and was the issue of other Diseases, and from the general invasion of Verminous cases. Acute Diseases of this Year proved to us the Matter to be an Acid Nitre dispos'd to corrupt and exulcerate, by which the Diseases seiz'd usually with a Catarrh, and ended with some Abscess. Putrid Fevers began with the Spring and Catarrhal, yet reigning from the declining Summer; great flux of the Blood ap-
b 3 *pear'd*

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pear'd at the same time, with Dysenteries, Gripes, and ill-natured putrid Pains in the sides: To all which the Cures happily succeeded that were directed by this reason of them, and confirm'd to me, that the matter in the Air was advanced to that Nature, as to be more dispos'd to Putridness and Corrosiveness, which I therefore assert to be the Nature of the Air in the present case; in many these Vertigo's and Pains in the Head blinded the sight almost; my opinion that in both the Nature of the Niter consisted, and that it flow'd together with grosser parts of the Air, was favour'd by the Observation of the Ratius of his Excellency the Earl of Manchester in their return from Venice this Spring; who upon their passing the Sea, suffer'd from the Wind which blew in their face, an unusual effect of common Cold, which was a Tumor of the whole Face, and universal Scabbiness agreeable to the before observ'd Qualities of it. I shall only add one Particular more, which is, that I have observ'd that those places that have been most troubled with Apoplexies, have been level and moist, so as in one Village so situate, these that dy'd went off mostly on a sudden.

Having thus asserted the containing Cause of this Disease, and shewn the Proximate Cause to proceed from a Congestion of Chyle in this as in other Glands, and to consist in the spoiling of its due Temper and Crasis, by inducing a Corrosive and Nurous Quality: The Disposition to this Distemper,

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per, appears likewise to be contracted by Replentia and Oritum, and which ruins the Tone and Temper of the Glands the same way, but soonest thick Fermented Liquors, especially the stalest: The dexterous Effect of these in all Diseases of the whole Glandular kind, is sufficiently known. How much by this Observation we may hope to have this Disease within our power, though we cannot mend the Air, may be understood by considering that the Air hath no power to change our Bodies, but as it hath a Delinquent Chyle to work on, as I note afterwards. But as this plainly exhibits the best method to prevent, so also that the Chalybeate Waters are the best Cure. Their power in Diseases of the Glands, to remove Obstruction, and restore the due Crasis and Temper of them, I have shown; and as the Steel is the only proper Body to do this, which mechanically serves our Life, at least in preserving this Tone and Crasis, which Alkalies and Nuxes destroy: So it seems to affect the Glands only, since in a Chlorosis it is not easie to conceive the so sudden raising the Blood by so small quantity of even a Tincture of Steel otherwise, but to keep to experience as it appears that in these Distempers of the Glands, the Chalybeate Waters are the only Remedy; and as the light sort absorbent best, so the more Acid sort are peculiar in this Disease, more powerfully resisting and correcting the Nature of the Chyle, and rendering it more fluxile and suppressing Hæmorrhage, and to strengthen and make firm the

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Brain, which is observable in their *Formas* reduced. But to remove a Disposition to this Disease, the Time, or State, or Cause of it, may either make the use of these Waters exceptionable, or require a particular regard either before, or in Conjunction with them, I shall consider the differences thence arising, and the distinct regard they claim; that these may be distinguish'd with some certainty, and may be of use to direct us, there is the highest reason to believe, that since in all the Cases recited by Authors, the Nature of the Disease is ever sound answerable. Now considering that an Apoplexy consists in the Admission of parts to the Brain, that either are *Aerial*, as is what the Blood convicts, or *Elastick* and *Flammable*, as is the Matter in the Arteries, and that the admission of both is owing to the Crasis and Temper of the Brain, as of the other Glands destroy'd or degenerated; which is perform'd in the Chyle by the Air, or degeneracy of the Juice by other means, as may abundantly be prov'd to be the Case of Hemorrhages in general; we are hereby help'd to understand the reason of the variety of the Remedies that have been observed to sit aside Apoplectick Fits. And although in a Case of such danger, Applications are justly made of universal Intension, yet they usually succeed as they attend the State and Nature of it, as well as are commanded by the strength of the parts; and Interventions are thus best urg'd, that respect the Matter as confirm'd when Old: 2ly, When capable of Revulsion

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Remission by Bleeding, when that confines it, as in the Plethorick, by Vomits in full Feeders: 3ly, By promoting the Secresion by Catharticks, as in the Phlegmatick Blisters, &c. 4ly, By thinning and lessening the Flatulency of the Matter, and driving it forward either into the Secretory Vessels, or at worst through the Brain, on which strong Apoplectick Waters are observ'd to effect, when the Fit is without a Procatarxis, or changes into a Hemiplegia, being small in quantity. Again, Bleeding may be the only Remedy which ought to be us'd, from the Nature of the Disease impelling, joyning and indicating, as a Disposition to Hemorrhages, or stopping of one; and thus I have more than once, by Bleeding chiefly, made an Apoplexy remove, and change it self into a Gout in the foot.

Lastly, Some Cures have been perform'd by Medicines that regard only the Nature of the Matter, by resisting the Flatulency and Coldness of it, and perhaps by strengthening the Brain vitul. And that is to be further and more nicely considered; for beside the general Intentions which the State of the Matter requires to be particularly insisted upon, with reference to the Fit, either to be remov'd or prevented; There are also some Conditions of this Disease, particularly to be respected in curing a Disposition to it, which is receives from the Constitution of the Part, Confirmedness of the Matter, Quality of
the

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the Matter, and lastly, the Causes original or concurring of this Distemper: For although these Waters are experienced a compleat if not sole Remedy in the two common Cases of Apoplectic Persons, a Haemorrhagious Disposition, and a Sanguinary Plethora, as likewise in a total Intemperance producing them; yet a preparatory Course, or Medicines conjointly applied, may be necessary: First, In old Age, by warming Cephalick Medicines, or moisture of the Brain, in which astringent Chalybeates, as Crocus Martis astringens, recommended by Dr. Cole, or Ess Veneris, which I more use. Secondly, If intemperate, or from confirm'd Hypochondriacism, where the Brain may be calculeous by a previous course of the Light Chalybeate Waters. Thirdly, The Matter may be Cold and Flatulent, as the Case recited by Sennertus, in which rotulae of Ol. Carni and nuc. moschat. succeeded, if we consult the genius of the Humour in the advanced degree of it of this present Time, it may be proper to take off the Acidity by Alkalis, in which Coral ought to have a share join'd with Carmi-natives and Discussers of Flatus; and to back these with Astringents and Purgers interpos'd. Which I may confirm by an Observation I have made in some that I have cured; that upon the first removal of the Fit, the Humour remov'd into some other part as the Feet, and appear'd in a puffy cold Humour. And in others I have found an Apoplexy to proceed from the bare trans-lated

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stated Matter of the Rheumatick Pains, and thus in most of those that are taken; and as this accounts well why Cold should increase them, so that the Cause is the same, appears in that this Catarrhal Matter, when it falls on the Lungs or Bowels, hath usually produced Blood, as I find daily. And this I observe the rather, because it clears my proof of the Matter to be Natural, and that the increase of this Disease is owing to an increase of the same Matter in the Air, its Subtily, Coldness, Flatulency, and Corrosiveneſs, which the Coldness and Moisture of this and the preceding Tears favour. The last regard is to the Causes concurring to the Production of it, as the Chlorosis, stopping of wonted Flux or Hemorrhages.

The Course to be applied in all these appears in Authors, and need here only to be intimated. Where none of these are coincident, besides general Evacuation to be premitted, only good Deterſives may be recommended; the most successful of which, that I have observ'd, I have nam'd afterwards.

The Affectio Hypochondriaca, which I have observ'd to be reliev'd by them all, but when confirm'd to be cured by the light Chalybeats, and secur'd by the more acid, to which the Purging Waters elſted according to the requisite Qualities ought to precede, needs no Address to shew their place beside the reciting their Symptoms. What

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is necessary to contribute to the Cure or Continuance of it, being a change of the Course of Living to a more natural one, instead of particularizing I choose to illustrate, by shewing the antecedent Causes of it, and that it is a Disorder of the Recrements of the Chyle. As this is a Cardinal Distemper, of them, I have enlarg'd the thought not unusefully to the other turns these receive at the several grand Powers of Man's Life, and the Diseases thereon depending: And though I could not be particular in the Explication of this, yet the mistakes about Humane Nature are such, even of seemingly sound Persons, but are very unhappy in the Hypochondriacal; I have offer'd somewhat notwithstanding at the general Reason of the Distemperature of Body and Mind, and the universal Efficacy of this congested Matter. I am of Opinion that by this thought, more of a just Notion of our Nature may be retrieved, and of the Efficacy of Mineral Acids in contradistinction from others, how they confirm our Nature, and particularly why Steel; and how and on what Account, and what the Temper of the Glands, and so of the Brain, consists in. The Nature and Qualities of the Air, prov'd by its Effects, both ought and might be, I fancy, better clear'd, and the Truth and Excellency of this Method be prov'd in the Acute Diseases likewise, wherein I have found it of happy Use; which I hint, to encourage the Prosecution of it, because I have observ'd Feavers themselves to have enough of their reasons

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reasons appear to distinguish the Success of the Observer of them; but as these either want place or room here, so instead I am oblig'd to excuse the whole discursive part of this Book, and particularly the Impertinencies and Imperfections of it, being only casual, and written raptim, and much of it never read over by me till printed; and were design'd but as Hints, and beside the design of the History; so that the great Precipitation with the Impediments, made much or all of it so far from being exact, as to be thoughtless almost: In which part I reckon the Enumeration of the Sentiments of Authors of Apoplexies, and the distinction of some Symptoms: And in what I offer to the Learned Dr. Cole, of the Seat of the Disease, it is Obedient, and is submitted to his Judgment; my Intent being to explain and carry on the Inquiry, not to oppose. In my examining the Waters I was exact to the best of my Skill, and had it perform'd at the Springs, trusting only to the procuring Barnet, Stretcham and Upminster, the last of which was sent me by the unquestion'd hand of Mr. Jossely of Brentwood. And least an Objection should lye against the cleanness of my account of the Pyrites found in the Purging Wells, in that the common Copperas stone should be found mix'd with them at Harwich at the base of the Loamy Cliff, I must observe that they are only found among the gravelly lays that fall from the top, and that be it, however it sufficeth to my purpose, that these Stones are only a common Base of
this

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this sort of Earth, as well where are no Purgins
Springs, as where there are, and so not of a for-
reign Original.

Lastly, Why I publish any thing so loose and
unaccurate; I can only say, that the Discourses
which were written off hand, had not the leisure for
Thought, that the experimental part had (which
was in good measure done before I left Cambridge,
and so before I enter'd on Practice) neither had I
a prospect of an Opportunity to perfect. And all
my Thoughts I offer no otherwise, than with Sub-
mission to better Judgment to correct.

A Supplement to Page 90.

FOR particularly, besides the Arguments drawn from the Excellency of our own Mineral Waters, and their more distinct appoiteness to several Cases, which recommend the Use of our Waters in their lieu, as being more abundantly useful to us, so there are some Objections that lye against the use of the *German Spa* with us, which it is not amiss to advise the Reader of. For not only the Waters suffer so much by their long passage, as at best to retain but a diminish'd Proportion of their Virtue equal to their Tincture of Steel, but also that Water, which by reason of its long retaining the Tincture, is sent abroad, and is medicinally drank with us, if it did retain its Chalybeat Power (which it seldom doth till it is used) is of the heavy and less effectual sort in the more nice Cases, and its Salt approaching to an Alkaly, and scarcely curdles with Soap or liquid Salt of Tartar, not so much as our gravelly Pump-water, nor disturbs a Solution of fine Silver in Spirit of Niter so much: And to this agrees the Observation of the *French Academists*. All which I offer to be consider'd and examin'd by Physicians, who may get it more fresh than mine were, and observe their Use.

ERRATA

ERRATA.

PAGE 36. Line 23. *Observ'd by*, add *Dr. Lower.* p. 67.
dele *quin.* p. 69. for *pen's* read *pends.* Where *Mr.*
Simps is mentioned, read *Symonds.* p. 113. at the bottom
before *unacquainted* dele *ant.* p. 113. l. 12. after *at me,* in-
sert *end.* p. 114. for *seful* read *Fifful,* p. 116. l. 15. after
hand, add *except Salts a little more mix'd, as those of Ken-*
sington and Woodham-Ferry's. p. 126. l. 15. after *Acid,*
for *of* read *and.* p. 134. l. 15. for *Camella* read *Lamella*

To the Class of *North-hall Water*, where the Nature is
determin'd to resemble Spirit of Salt, add, *and to re-*
solve of Spirit of Vitriol, and may be a peculiar in the Stone
and Stoppage of Urine.

The Colchester Selenites was found in a Bed of bluish
Clay, as my Worthy Friend Mr. John Luffkin of that Town
since inform'd me.

And other escapes may be, that the Reader may easily
correct.

T H E

Natural History

O F T H E

Chalybeat and Purging Waters

O F

ENGLAND.

The Introduction.

THE Method which I thought reasonable to take, to get an Account of these Waters, and which affords the Minutes of this History, was the examining the several Wells and particular Matter of them, and tracing their Earths and Springs by the help of their proper Signs, and then to add to these the Essays of the Waters: And the Universality and Accuracy of this Inquiry have distinguish'd it, by the Success of a clear Discovery of their Principles. I am not ignorant that this History, as

it is an exact Examination of the Nature and Origin of Waters so much in use, and as it may advance and be helpful to a General History of Mineral Waters, needs nothing to recommend it; yet Use being the Design of this Treatise, and because to give the Reader a View of the Benefits proposed by it may facilitate the understanding of it, I shall shew that the Usefulness of this Inquiry is fully proportioned to the Difficulty of attaining it. For besides the Satisfaction to the Drinkers of them, which ariseth from the Knowledge of their Principles, the Effects of the Chalybear and Purging Waters of *England* are so great, and the Cures perform'd by them in Obsolete and the less understood Distempers are so very extraordinary, that (were their Natures better understood) we must expect no inconsiderable Advantage from the proper Use of so Noble a Remedy: Since this would direct us not only to the more certain Use of them, but advance our Understanding to the Discovery of other Distempers, in which they might succeed and help us to avoid all that ill Success that attends their improper Administration. How necessary such Exactness is to the understanding their Natures, will appear sufficiently if we consider what vastly different Qualities are found to be in the Waters reputed of the same Species, which yet may be owing only to the Variety of the Salts with which they may be impregnate; of which Variety I shall give some particular Instances, because it is of great Consequence,
and

Chalybeat and Parging Waters. 3

and hath hitherto been unheeded. The Vertues of the Chalybeat Waters have been as yet so much attributed to the Metalline parts or Steel, that (setting aside the Vehicle of Water, the Benefit of which is taken notice of by some) in the Choice of these nothing usually is consulted but the Quantity of Steels evidenc'd in the depth of its Tinging with Galls, and yet in this so uniform a Species, it is easie to discern that Variety of Nature and Effects, that will oblige him who observes it, to allow so much to the Menstruum of it, or the Salt that is added (either in its Quantity or Quality) as is sufficient to constitute Medicines of a quite different Nature. Hypochondriacal Cases (in which the Intention seems most General) the Light sort claim as their Province to relieve; and I never knew the Heavy ones used in, but with the ill success of aggravating the Distemper with an uneasy Hear, and with very little of the good Effects that attend the light ones. The Propriety of these Waters in some other Distempers, as Obstructions of several Parts, upon the account of their lightness and thinness, and particular sort of Spirit, appears likewise in the Chapter of their Vertues. The heavy Waters that have more of the Mineral of Iron, but clogg'd with Salt, have different references according to the differing Nature of the Salt, and quantity of Mineral they bear, whereof the Nitrous (for such some prove to be) regard properly that heavy and black Crasis of the Blood of the Melancholick; for I

distinguish the Melancholy, properly so call'd, which hath its Root in the Constitution, from the *affectio Hypochondriaca*: The other, which have a Salt of the same Vitriolick Nature with the Spirit, are a peculiar in those cases which I call Climacteric of elder Persons and some others, which require the enriching of the Blood, and the help of a Salt more effectual, gross, and lasting, than is the light Spirit. And as some cases may require the same Vitriolick Salt to help the Appetite and restrain Flatulencies, where the Blood as it needs not, so bears not much of the body of the Steele, [For such is the case in some Persons past Fifty, of a florid Complexion, and who breed Blood fast] so a Water that is thus qualified, of which I have given an instance, may be reputed another Species, and for its real use deserves well to be distinguish'd. The Salts which these weighty Waters extract from the Soil, it is likely may vary very much, yet having not found any of them to contain Saltpetre, and the difference of their Virtues depending chiefly on their being more or less Alkalifat, I say not so much ought on those lesser Qualities, as to distinguish the Waters by them, though I take notice of the. the Essays of the Waters: But there are other Qualities that Waters may derive from the places where they run, which are less sensible, and may lye in some Motion or Texture (rather than in any Accession of Particles) that a particular Distemper or Constitution, besides what a tender one might, may receive

Chalybeat and Purging Waters. 5

receive an Impression from; these are Coldness and Hardness: And these are so considerable, as to be allow'd by some Physicians rationally enough, to have been the Cause of an Epilepsie, that seiz'd a Gentlewoman, whom I knew, upon drinking for a Chlorosis a Water that issues from one Quarry. Again, as the Waters have different Effects from their different Qualifications; so they have some Effects in common from their common, or general, or more Essential ones. That which I shall take notice of here, is the Prevention of the Generation of the Stone; because their Pretention that makes them here Competitors, is a Propriety of this Kind of Mineral Waters, which is explain'd in this History, and confirms it, and was never before discover'd or understood. The Purging Waters owing their Virtues wholly to their Salts, are much more various in their Nature, and the Ignorance of the different Nature of these Salts, has made their different Effects unquestion'd, and so hitherto to escape Observation; and though the Subtility and Fluxiliness of some of these Salts, and not of others, may seem to most Men too slight to deserve Consideration, and has neither been observ'd nor inquir'd into; yet it is most certain, that those very Qualities give the Waters a different Capacity. *Epsom* and *Alton* (which both bear only this kind of Salt, that neither admits of Christallizing, nor abides the Warmth of a Temperate Hand) on this Account, as they are more Effectual in

Grosser Bodies, so in Leaner in the very same Cases prevail not; nor agree: And on the same Score, I have found them Effectual in some old Cholicks and Cramps, where the Passages and Vessels that wanted cleansing were very small, or the Matter glutinous or viscous. The same Qualifications which these Waters have for detèrging, and are conspicuous in the Gallings of the Arcus and Urinary Passage, that attends often the Operation of these Waters, above what is usually observ'd in drinking the others, may reasonably enough have an advantageous Use likewise in Ulcers of the Kidneys in a cautious and judicious Hand; and they often have been by me observed to be successful in some Obstructions of them; which together with the Inconvenience of an Ischuria, that sometimes attends their improper or unseasonable Use, makes this Consideration to merit our Attention, and besides, the Softness of the Salt I am speaking of, may give rise to a Thought, that some emollient or relaxing Quality may be communicated in some cases, as in Melancholy for example, above what other Waters can be expected to exert. But besides the Qualities now consider'd, this History will inform us of Differences of the Salts of these Purging Waters in more essential Qualities, and that these are almost as many as the Waters; whereof some few stand at such a distance, as Alkalys and Sea-salt; and their Virtues are so proportionably distant, that till I consider'd, that the Knowledge of the first, assisted me in the
Observation

Observation of the latter, I was apt to wonder how so frequent Instances should slip the regard of even the most considerable Men, it is familiar for Scorbutick Indispositions, to be reliev'd by one Water and aggravated by another. I have known Instances of a Scorbutick Scabies, and a Leprous Disease, each increas'd by drinking the Water of *Brentwood-well*, which abated upon the use of *Woodham Ferrys*. And this is the clearer and fairer Example, because both these Diseases have been effectually cured by *Lambeth Water*. And I may observe, that this makes much for the Validity of this Account, that the discoverable Qualities of the Salts of these Waters, so justly correspond with their experimented Virtues; for which reason in treating of those Waters now nam'd, I have oppos'd or compar'd the Qualities of them to each other. Indeed, though the clear and convincing Detection of their Differences, and of the Salts they bear relation to, be only subject to nice Essays; yet they confess to the bare Taste wide differences, some being Bitter, more Saline some, some Sweet, some Insipid, or near the Taste of common Water, some have a Vitriolick Sweetness, some are Austere, &c. which hitherto has escap'd Observation: So that Mineral Waters seem one of the greatest as well as the most useful Branches of the *Materia Medica*. In sum, It is by the understanding their Origine and Nature, that we can ascertain Rules and distinguish Errors in taking them, readily discover their proper Uses, and by directing to other Cases and Distempers

in which they may be applicable on the same Reason and Account, may improve and advance their Virtues: And besides, the least piece of Service this does in the recording their Uses, and giving those Signs, that may direct the Discovery of other Wells, with the advantage of an Example to direct the proving them, is not inconsiderable. The Benefit of all this, that I may not seem to abound in my own Sense, I shall give in the words of the Philosophical Transactions of the Royal Society. "All which being con-

Numb. 51. "der'd, we cannot but add, That
" whoever discovers such Healing

" Waters, and publicly prescribes the safe and
" right Use of them, does really distribute larger
" and nobler Alms, than if he built and endowed a
" Savoy; for this prolongs Life, and restores
" Health (which is sometimes better than Life)
" both to Rich and Poor, to Natives and Stran-
" gers, to Neighbours and Travellers.

According to this Design, the History of these Waters will come under these three Heads; The General History of them; The Essays of the several Waters, and then their Uses. I shall treat of these two Kinds of Waters distinctly, and observe that order, that Repetition may be avoided, and the former parts of the Discourse may enlighten the latter.

Of the Nature of Common Water.

THere are many Questions, which seem to lye in my way to be discuss'd, as of the Origine of Springs, Nature and Origine of Mineral Juyces and Vitriols; Of the Causes of the Heat of the Earth, &c. which the following History makes to disappear. I shall therefore avoid the Prolixity caused by such Disputes, and only make some Remarks on the Affections and Nature of Simple or Common Water, which may help us to the better conceiving of the Nature of Mineral ones.

1. Waters receive their Salts of the Earths they wash.

2. Common Water holds no Metalline parts, nor will receive any; Mineral Acids being necessary for Vitriols: And though gravelly Waters, just at their Eruption, will take so much of an Iron as with Galls will make Ink, yet that the Acidity belch'd up at those places is a distinct thing, and not of the same Original, is evident, in that the Water looses that Quality a few Yards from the Spring, and then ceases to take any discoverable Parts or Qualities from either Iron, or Copper, or Brass.

3. All Waters flow on a Loam, or fat heavy Earth, such as Tiles are made of, and there is a dead heavy Tort of it, known by its Blackness, Weight and Stonyness, which is the common Floor of Springs, and is therefore call'd in *Norfolk* the

the Pan of the Earth, beyond which no Pump-maker expects to find Water, or attempts to dig for it: All the Earth above this approaches to a Nitre, being so much the more Nitrous, by how much more it is wrought on by the Sun and Air: Nitre being receiv'd as a Name for any Native Salt of the Superficial Earth, by the Sun and Air produced or separated, which is void of Metalline Parts and Nature, and in differing Climates is advanc'd toward an Alkalifat or Urinous Salt, in proportion to the Heat of the Country, and Situation of the Soil. And I never found any Metalline Bodies or Juices yet, but what were embrac'd in Stone or Loam, and not in Clays.

4. Hence Waters that wash this upper Soil, or Rivers and Springs that lye in Clays, are Saline; Gravelly Waters yield little besides some stony parts, unless they have wash'd off some Salt from Neighbouring Soils; which discovers its Original in the Effluvia.

5. Not to take notice of the Qualities of Humecting or Moistning, &c; the most considerable Affection of Water is, that it is void of Elasticity and igneous Particles, and unsapt to Fermentation.

Yet these Observations of mine, I offer not otherwise, than to submit them for better Judgment and Experience to inquire into.

The Waters under Examination are the Saline, namely, The Purging ones, and the Acidulæ or Chalybeate ones; Of these first,

P A R T I.

Of the Chalybeat Waters of England.

THE Chalybeat Waters are preferable not only for Antiquity of Discovery, but also for Virtue, being an effectual Refuge for many deplorable Diseases that no other Remedy prevails in: They are quick Springs, ever flowing in a Sand or Gravel. I shall first state their Characteristicks, or Signs by which they are distinguish'd from other Waters; and then explain those Circumstantial Signs, and their Reasons, in an account of their Nature.

Their Characteristicks are,

1. To shew the Mineral they bear (which is Steele) in their Taste, and with Galls, to evidence it in the blew or purplish black Colour proper to Vitriols of Iron, as also by dropping a Ferrugineous Ocre at the Spring.

2. The second is, The Lightness of the Spirit that holds the Tincture, which vanishes upon exposing to the Air, and leaves the Water without the Mineral Tincture. The lightness of this Spirit so affects those Waters of this kind that are more void of Salt, as to render them lighter than Rain-water distill'd.

3. The

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3. The Spring ever proceeds from a Rock usually consisting of gravelly Stones cemented together.

4. If it joyn any other common Water immediately near the Fountain, it thence incrusts the Stones and Stricks, which it washes, with a Mortar-like crust. The notice of this Incrustation

has made many Learned Men, and
Part 2. particularly *Dome Panarolus*, erroneously to entertain an ill Opinion of the

Water, because (as he observed in that four Miles from Rome, *extra Portam hostiensium vulgo S. Pauli*) of the stony Matter the Water leaves where it passes, and this through the Mistake that this Matter is in the Water at the Spring.

5. To bear an Oily or Bituminous Film on it like a Scum.

6. To give a Green upon the Mixture of Syrup of Violets.

These Waters differ on account of the Salt of the Water, in the Quantity or Quality of it, or proportion of the Steel they bear; and so may not have the second Qualification which is proper to the simple ones. For the Nature and Reason of these Waters, we must examine these particulars, not only since most of them are the Indexes, but also are effected by the Essential Properties of these Waters; and shew the Metalline parts, and the Nature of the Menstruum or Spirit. The Metal is evident from the blew black they take with Galls, from the Taste, and

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and lastly the Okar which it casts out at the opening of the Spring, which calcin'd with Salt, and expos'd to the Air, shews none of the Verdigrelike Colour that Hungarian Vitriol gives upon the same Trial. The Menstruum, or Spirit, is a distinct thing from the Salt of them, and of a differing Original, being contrary in Nature, not held by it, and being found in those Waters that want the Salt, for the Salt of those that have any, is wash'd from the Earth by the Water, and the Spirit is only a Steam that comes along with the Gravel. The Spirit, or Menstruum, that bears this Tincture, is Volatile, and continues not with the Water many hours, (scarce well one in the light sort) though well cork'd up. What effect Hermetick Seal might have, I never had encouragement to attempt, as never believing that a fair Trial, where the power of the Fire came so near and so naked, and the Chalybeat Waters that abound with Salt are often Nitrous, and so may mortifie the Spirituous Acid, which may make it in vain look'd for in the Receiver: This I mention for caution sake; for that this Spirit is Volatile, yet that it can be detain'd by a cover of Oyl for ten days, I lately try'd with a Light Chalybeat at *Felstead*. The Original of this Vapour is pointed out to be low, and to proceed with all Gravel; as is evident in free Springs, that upon laying Iron at the Eruption of them, will Tinge with Galls, which power the Water loses at a Rods distance; but in these it is less in Quantity.

The

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The Nature of this Spirit is Vitriolick: They disturb not a Solution of Sublimate in fair Water, and with *Lignum Nephriticum* thickens a little with a Cloud, but do not the least change yellowish as Pump-water and Nitrous, but near that of a Solution of Vitriol, or its Spirit upon the same, though scarce so clear, because all these Waters have a touch of the Salt of the Soyl, as appears in the green with Syrup of Violets. They all likewise render a Solution of *Sal Saturni* in fair Water milky, by which the Spirit is distinguish'd from *Salpêtre* or its Spirit. Note, That though these Tryals are fairly made, only in the lighter simpler Waters, in order to make a Judgment of them, yet they hold in the heavier Waters, except that Tryal with *Lignum Nephriticum*, in which they discover their Salt, by the yellow colour they give. Now the Nature of Salt of Vitriol appears upon examination, to differ very little from common Salt (if any thing) more than in the Qualities impress'd in it by the Metal; and it is worth our notice, that Vitriols and Nitræs precipitate each other, being the Product of two several Regions, which will enlighten to the Understanding the next Particulars observ'd to attend these Waters.

The Earth and Soyl of these Springs, is ever a Sand or Gravel, and the Water issues from, or rather makes, a Rock of cemented Stones, which are never to be found, but where the Water is Vitriolick. This sort of Rock is open

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to view at *Tunbridge*, and has never yet fail'd, where the Ground in which these Springs are found has been open'd, as at *Norly*, *Felstead*, and other lesser Springs. I am apt to think that Iron may have a particular Qualification for the cementing of Earth and Stone, but that I may follow my subject more closely, I shall only consider it as the next Particular illustrates it.

These Waters, when they joyn another Water, at least a gravelly one, e'er they have run so far as to lose their Spirit, precipitate a Mortar-like substance, wherewith they incrust the Stones and Sticks they pass over. That this stony Matter is precipitated out of other Waters which flow into it by the Virtue of this Water, and proceeds not from the Chalybeat Water it self, beside the Argument that may be drawn from the Lightness in weight of the Chalybeat, appears fully demonstrated at many Springs, indeed, at all, where the rill of common Water runs along the side of the Soyl whence the Chalybeat issues, especially when it is in a Meadow (as it was at *Felstead* where I first observ'd it) no Incrustation or Precipitation of stony Matter being to be found either in the Meadow where the Chalybeat lyes, or above before the other Water joyns it. The Water I now nam'd, is one of the light sort, being near ten Grains in seven Ounces lighter than common Water, and the Water that joyns it a hard gravelly one, which with Tincture of Logwood gave a Raspberry red as Acids, which is not
amiss

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amiss to mention. The Reason which I intimated above, to be from the differing Nature of Nitre and Vitriols, may help make this intelligible. The Lightness in weight of the Chalybeat Waters, that as they are void of Salt, may properly enough be said to be more simple, is owing to the same Cause, and proves the same thing, being not from difference of the Season, as is usually judg'd, which can never make it lighter than even that Rain-water distilled, that must render it so; but from the Depuration it has receiv'd by the Precipitation of the Earthy parts: And the Property is the same by which these Waters even in Human or Animal Bodies Cure the Stone, by removing the Disposition to it, as well as early Precipitation of the Matter; and this Virtue in the Waters is so constant, as to have made them Famous in this particular. The last considerable Sign and Attendant of these Waters, is the Bituminous Scum appearing on them, how far the firmness of the Earth of these Waters is assisting in separating this Spirit, or whether it is the Effect of it, is not plain, nor very material to learn: That it is of the Nature of common Salt, to assist in the Separation of Oily parts, is evident in pickling Roses, and distilling Oyls, but whether it be from this, or the Putridness of the Soyl and Earth, I shall submit, and leave.

These Waters differ not only in Degrees of Hardness and Coldness, which is best taken notice of in the Examination of each Water,

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Water, but may be distinguish'd into these two Heads.

1. The Light ones, which have more of the Spirituous Parts of the Vitrioline Spirit, and more Simply.

2. The Heavy ones, that contain a Salt approaching to a Nitre, or is Nitrous.

Of the Heavy ones first, and then I ascend to the Lighter, which thereby may be illustrated.

The First Class.

Chalybeat Waters that contain a Nitrous Salt, and equal at least common Water in weight.

THE Salt of these Waters I conclude to be owing to the Soyle, because it is found to be of the same Nature, and has some Differences, but those being small, I omit, and forbear insisting upon them.

In the general Design of the use of Chalybeats, these Nitrous Waters are not so Effectual, and the more Nitrous the worse, by which I mean, the more Alkalifat; which is easily prov'd, by the early Precipitation of the Black, and the change towards a Green, which is the Effect of Alkalis with Ink, though at first they change the Blew Black into a Purple. The Characteristick Notes

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of these Waters, beside the weight, are, to drop the Inky colour they receive with Gall, to take a high colour with *Lignum Nephriticum*, and when the Water has stood to be effete, it will not precipitate Silver out of Spirit of Nitre. I have not found any of this kind so fully Nitrous or Alkalifat, as to trouble a Solution of Sublimate, much less to precipitate it Yellow, (both which indeed are inconsistent with Vitriols) nor any that bear a Salt of the Nature of Saltpetre.

A Water in a Field adjoining to the Right Honourable the Earl of Manchester's Place, at Leez in Essex.

THis Spring is in a Gravel, and is so small as to be considerable, only in that it is in a breeding Pond. This Water disturbs not a Solution of Sublimate in fair Water, it renders milky a Solution of *Sal Saturni*, by which it distinguishes itself from Saltpetre, but yet not much more than Salpêtres second Salt does. With *Lignum Nephriticum* it gave a pale Yellow and not fine, exactly the colour of small Bees, which at four days end precipitated so as to leave just the top of the Liquor clear. The Water kept till it had lost its Spirit, and with that its power of striking black with Gall (which was 24 hours) essay'd with Gall, was thick and

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and dirty white, which precipitated in the former Experiment, shewing an Affinity with common Salt, in this with Nitrous. It is much of the weight of common Water, and takes a blew black with Galls.

*The Water at Witham in Essex, in
Sir Edward Southcott's Ground.*

WITH Gell a deep Purple turning to Ink, not very clear; and with *Lignum Nephriticum* a faint dull reddish. I judged this to have more of the nature of the Salt of common Water, and that the Spirit of this Water to be a little finer than the other sort, which give a direct Black with Gell, because distill'd Acids give this Red. The Red that Alkalis give turns greenish upon standing, these Waters are all inclin'd to the same.

*The Chalybeat Water of Knarsborough in
Yorkshire.*

Knarsborough Water, as Dr. French relates, is of a Virrioline Taste and Odour; The Water riseth in a moorish boggy Ground (with-

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in less than half a Mile from which, there is a considerable Ascent) and springeth directly up from the Sandy bottom. It is of the same weight with common Spring Water: The colour with Syrup of Violets is much the same as in the Chalybeat Waters at *Islington* and *Hanstead*; not so intense as in *Tunbridge* or the *German Spa*, as the Learned Dr. *Tancred Robinson*, my Informer, prov'd it at the Spring. And as this colour is not so deep as that made by Vitriols, so the residuous dark colour'd Earth, after Evaporation, was insipid. The pitch of the Volatility of the Spirituous part of this Water is observable, in that it tinctur'd with Powder of Galls at two days end, and suffer'd not by Warming, yet lost that Quality wholly in Distilling. Neither does this Water coagulate Milk: The Redness that this Water takes with Galls, is effected by spirituous or distill'd Acids, unmix'd with gross Salt, of the Soyle of a Foreign Nature, which would disturb the Colour; and the larger Proportion of the Acid to the Steel, or the very small quantity of the last may effect it. But the Quantity of the Acid Spirit must be judg'd here to be considerable. For the Nature of the Acidity, I have before distinguish'd it by the Effects, and so need here only observe it to be Vitrioline, or of the Nature of Spirit of Vitriol; which is Essential to the Precipitations.

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Marks-Hall Water in Essex.

THIS Water joyning another in crusts, as do the rest, it is much the same with the preceding, containing little Steel, but a large share of an Acid not so Fugitive, as where it is in less quantity or ill coupled with a Salt: It gave a bright Red a very little purplish, not so deep as the preceding. The Colour it advanc'd with Gall, it lost again two days after, without Precipitation of any Ferrugineous parts, in which it differs from other Chalybeats. It rendred a Solution of *Sal Saturni* troubled, but not very milky, much as the rest; and it tinctur'd a high Yellow with *Lignum Nephriticum* as do Nitres, and a little clouded: It weigh'd likewise as the other, just the weight of common Water.

Ilmington Water in Warwickshire.

THIS Water of *Ilmington* being of the same heavy kind, and which (as I observe above) require less Accuracy, I shall give the Examination of it, out of Dr. Derbam's Account of it: With Syrup of Violets it turned Green; with Galls Purple, like Martial Vitrioline Waters: It exceeded common Water in weight near half a Dram in a Pint, being weigh'd in a dry

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dry Season. Indeed it is much the heaviest of this kind in *England*, (for it purges not as he informs us p. 53. but by Urine.) However, That it cannot vie with the lighter Chalybeats in Virtue, I shall explain in treating of their Virtues.

The Water in an open Bottle drop'd its Ocre, and with that its power of Tinging with Galls in twelve hours time (that is) a great part of it, which it did not begin to do in a Bottle well stop'd under a Fortnight, p. 88.

It yielded a Salt of an irregular shape, upon the residue after distilling Acid Spirits, wrought with great Effervescence, and not Alkalyine, p. 81.

The Salt was pale, and would not flagrate, p. 60. nor coagulate Milk, p. 77. The Earth like Red Ocar, and is contain'd in great quantity, a Quart yielding near a Spoonful.

It appears hence, that the Salt of this Water is of an Alkalifat Nature, and that it differs from the Salt of Fat, Mellow or Loamy Earths, which Purge, as we shall find in the latter part of this History.

Aylesham

Aylesham Water in the County of Norfolk.

THIS Water is in a Gravel, it has prevail'd in Fame and Resort over *Oulton Water* in the same County, which is a lighter and far more effectual Water, partly from the more convenient Situation of the place, and partly from the wrong Estimate that is made of Chalybeat Waters, by those that judge of their Goodness by the depth of their Tinging with Galls. It is heavier a little than ordinary Gravel Water; with Galls or Oken leaves takes a blew black, and makes a direct Ink; as do those Waters whose Salt has somewhat of the Nature of common Salt.

That the Metalline parts of these Waters are purely Chalybeat, I inform'd my self not in all but in some, as that at *Leez*, and some other smaller ones, by exposing to the Air the subsideant Okar, lightly calcin'd with Sea-salt, which would discover Copper if any were in it; and besides by the colour they give upon Tryals with Gall, the blew black colour being proper to Vitriol of Iron.

The lesser Springs of this kind are very numerous, in Gravelly Countries scarce a Village without one; upon the preceding Instances of them, I shall make Observation of their differences, and the Classes they must be reduc'd into, whereinto yet I did not adventure to digest

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them, lest in the Sense of others the difference should appear only gradual.

These weighty Waters are either, 1. the more pure and simple Acidulæ, which bear less of the Steel, retain their Acidity longer, and have not their colour with Gall dark or disturb'd, as the other sort, nor contain any Salt collectible; of this sort seems *Knareborough*, and (which is yet the higher of this kind) *Marks hall* Water, which gives a thin and bright Red with Gall, scarce beyond a Raspberry, and loseth its quality of Tinging without Precipitation of Oker, is of a pleasing acid Taste, as it were winy, and yet gives not the proof with *Lignum Nephriticum* that Vitriols do, or Spirit of Salt, but thickens reddish and cloudy, as the Seminitrous Salt shot in Cellars.

Or 2ly Attramentous, which give a full Black with Gall, and with respect to the colour they give, they are either blewish or reddish; the reddish, as that at *Wittham*, kept a Week, will be thickish and turbid with Gall, but disturb not a Solution of fine Silver in Spirit of Nitre, which the *Leez* Water (which gives a blew black) being more related to common Salt, did in a great measure precipitate.

Another difference that is considerable in these Waters, is the bulk or quantity of Salt they contain, as the *Ilwington* Water proves, which is not only much heavier than other Waters, but varies in its Effects, and equally to the grossness of the Salt, neither reaches the recesses

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cesses of Nature so far, nor passes so well.

To obviare some Objections, I shall observe, that the Reason why these Waters, which are equally with the other sort capacitated to precipitate the earthly parts out of gravelly Water, are not likewise equally qualified with Lightness by the same Vitrioline Spirit, is, because the Salt of these Waters is so far Vitrioline, as to be apt to joyn a Chalybeate Acid and consist with it; but yet to be separated by Heat; and is in some small measure of Nature, the same with that which is an Ingredient in Vitriols; for the Liquor of Vitriols, if boyl'd with too great a Fire, will precipitate their Ferrugineous parts, which the Boylers cure by adding more Iron to it: And these Waters, after they have drop'd the Oks, and cease to tinge Galls, with Iron will become Atramentous again, the first Alteration being chiefly perform'd by the Mortification of the Esurine Salt by the Nitrous: For besides the Argument drawn from the not abiding of the Steel in these Waters, the Nitrous Nature of the Salt is conspicuous in its high colour it takes with *Lignum Nephriticum* which Vitriols give not; nor do the light Chalybeate Waters, that proceed from a Ground where the Soyl is Fat and Bituminous, as I observ'd that at *Felstead* to be, and which yields little or no Salt.

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Of the Waters that are Light and purely
Chalybeate.

I Have clear'd the Reason of the Lightness of
these Waters, and with that have asserted
the Nature of the Spirit to be Vitrioline; since
all those Waters are found to be so, where their
Incrustations are found. And as the weighty
Stones take a full high yellow Tincture from
Lignum Nephriticum, so this light sort take
like with the same Wood, but retain their col-
our, only disturb'd with a light white Cloud
lying in it. *Lignum Nephriticum* makes no dis-
tinction in a Solution of Vitriol, nor in Water
sharpened with Oyl of Vitriol. These Waters
do not well conserve their Virtue two hours,
which yet will scarce be lost in ten days, if
headed with Oyl. They all give a purplish Red
with Galls, which, upon standing a while, turn
to a purplish Black.

Tunbridge Water in Kent.

T HIS Water gives a deep Green, with Symp-
toms of Violets, as Vitriols do; and in the quan-
tity of about seven Ounces and a quarter,
weigh'd ten Grains lighter than a River-water
near me, (which was lighter than Spring-water)

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and as much lighter than Rain-water, and about four Grains lighter than the German Spaw, to which it is preferable on that account. The Ground above and about this Spring, is a cemented Rock; and the Spring is large, of long use, and much celebrated and frequented.

Wellenborow Water in Northamptonshire.

THIS Water weigh'd at the Spring eighteen Grains lighter than common Water, in a quantity of about twelve Ounces; with a few drops of Tincture of Logwood, gave a Black; with Syrup of Violets, a deep Green; with Syrup of Cloves, blackish; with Galls a Violet.

Islington Water.

THIS Water, as the rest, makes no Alteration in a Solution of Sublimate, and with *Sal Saturni* dissolv'd in fair Water became milky a little, and a little curdled, and not clear as with a Saltpetre; with *Lignum Nephriticum* it remain'd pale, but clouded a little with a thickish dusky White, near a Rain-water, and weigh'd two Grains lighter than *Tunbridge Water* in the same

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same quantity, which I thought might be owing to the difference of the Season.

Pellstead Water in Essex.

THIS Water lies in a Moor, the bottom whereof is a cemented Rock, the Earth where the Spring rises, is Fat and Bituminous, or Unctuous and very Ferrugineous, no Incrustation in the boggy Hole where the Water stands, but the Water that passes through the Meadow begins to incrust as it touches the Ground: It is of the same weight exactly with *Tunbridge*, it becomes milky with a Solution of *Sal Saturni*, and with *Lignum Nephriticum* suffer'd no stain, but only a milky cloud swimming in it. This is but a small Spring, scarce more than a Land-drain.

Of the Virtues of the Chalybeat Waters.

THE Virtues of Steel are so very great and large, and in many cases so contrary, as not to be explain'd by what are grossly call'd the first, second or third Qualities; but to help us to a Notion of them, we must consider the Essence of this Mineral in its Affections, that are apparent.

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rent. And thus we may conceive of it, as a hard body of the Mineral Kingdom, and so qualify'd with Firmness, which is apt to enrich the Blood, being easily convertible into Fat or Sulphur, the nature of whose Sulphur, is to preserve Fluid Bodies, and the Temper of whose Acid Spirit, is such as raises, and yet restrains or rather adjusts the Fermentation of our Stomach, Soluble, Friendly to our Nature, and some-how Correspondent to the Mechanism of the Air we live in by its Magnetism; and then we may intelligibly add the more Simple, and other evident Qualities, as cooling, potential Heat, Drying, Balsamick or Healing Quality, &c. which I shall take notice of under these Heads, in these Waters.

1. They Invigorate the Blood and Juices as a Chalybeate.

2. They Astringe.

3. They Incise and Attenuate by their Acidity.

4. The Acidity is Connatural, and agreeable to the Ferment of the Stomach, and other Offices, which these Waters promote.

5. On the same account, and partly in that it is Sulphurous, it is a Frænum, or Curb, to Fermentations and Flatulencies, and performs more effectually what Oxycrate does in the Vapours in Women, and Spirit of Sulphur or Vitriol in Men, whence the Acid seems adjusted to the Temper of our Bodies, which can preserve the just Fermentations, as it destroys or reduces Exorbitant ones.

6. They

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6. They depurate the Joices of foreigner groffer parts, lodg'd with the Nourishment of the Body, as is evident in the Stone; which is but the same thing which they effect in gravelly Waters at their Springs.

7. The Acid being Spirituous, passes where other Medicines cannot, and so are Diuretick and Exterminare, and discharge the offensive Matter by Urine; and the rest it Volatilizes.

8. The Vehicle of this Mineral and Spirit, is not apt to Elasticity or Fermentation.

And on the account of these Qualifications, the Chalybeate Waters warm, strengthen, heal, open Obstructions, absterge, invigorate, and thus are capacitated to stop Fluxes of all sorts, and remove many Diseases, among which the Stone and *Affectio Hypochondriaca* stand at the Head.

But although all the sorts of Chalybeate Waters have some Qualifications in common, as to invigorate the Blood, and cleanse the *Viscera*; yet as they differ in their Salt, so likewise in their Virtues; which I shall particularly treat of.

Of the Chalybeat Waters of England. 31

The Virtues of the Acidula.

*Which Name I would make proper to those Waters
that are lightly Chalybeat.*

THese have a fine Acidity, not collectible into a Salt, the residue upon Distilling, being an insipid Ferruginous Earth; and as I said before, give only a Clarer red with Gall. That which is proper to this sort of the Chalybeat Waters, is, That they are free of any gross Salt, and have plenty of a Vitriolic Acid, with little of the body of the Steel, and that Acid more fix'd than in the light Chalybeats. In order to understand the Benefit of this, I shall observe that there are Cases that require a Water so qualify'd, either on the Score of the Distemper, or Constitution of the Patient, such as we commonly call Complexion; in which a quantity of Steel may do more harm, than the Vitriolic Spirit can do good. And this must be allow'd me, to be in all Cases and Persons, where the Blood offends in quantity, Floridness and Fluxion, by every one that observes the power Steel has to heat and invigorate the Blood in the Arteries. And when I consider the opposite Nature of Chalybeat Acids, and Nitrous Salts, as I observed before, I fancy I have a clear Reason for all this. One Case that the Body of Steel agrees not in, is that Indisposition of fresh colour'd florid-complexion'd Persons;
about

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about the last grand Climacterick, as I call that of 49, who are liable to Fluxes of Blood, or great Tumultuations of it. It is very easie to discover the Alkalifat state of the Blood in aged Persons, by only tasting the Urine, which in those grows almost Caustick. The Diseases that this sort of Water is a peculiar in, are Apoplexies, Phrensies and Fluxes of Blood; and because the first of these is a Distemper that has strangely rag'd of late, and extraordinarily this last Winter, beyond what has been observ'd perhaps ever before, to explain the reason of it, so much as to give light to the Effect of these Waters, may be no unacceptable Digression.

Of the Apoplexy.

THE Reason of an Apoplexy, and the Cause of so sudden a Deprivation of Life, this great Judge, the Prince of Physicians, *Hippocrates*, resolves into a Stagnation or Stasion of the Blood, whereby all Motion and Action of the Spirits is taken away; understanding the Blood to be Spirituous, and as not only supplying Matter to the Animal Spirits, but continually Cherishing and Preserving them in their Natural Disposition. And he supposes this Stasion of the Blood in an Apoplexy, to be in the Vessels of the Neck and Breast chiefly, and that its Motion is stop'd
either

either by Sharp Humours, or a Plethora, or an Afflux of cold Humours; the last of which he makes not so sudden.

The Sense of the Greek and the Arabians, I shall give in the words of Avicenna, transcribed out of Joh. Jacob. Wepferus.

*Apoplexia reddit membra sensu & motu carentia, propter angustiam afficientem ventriculos (sen-
tendum & innun; utrumque enim vocabulum
Arabice significat) actebri, & canales spirituum
sensitivi & moventiu. Et Paulo inferius: An-
gustia hac fit vel propter compressionem seu in-
cubationem, vel repletionem, compressio autem fit, si
corripitur eo quod ipsum, sc. cerebrum vel dolore
afficitur, vel laesit, seu molestia aliqua veniat, vel
contrahit, seu constringit, sive sit qualitas et ad-
iuncta affixione celeriter spissans medicamentorum,
sive frigus vehemens. Repletio autem est vel cum
tumore, vel sine tumore. Repletio cum tumore est,
si contingatur illic materia, occludaturque partim
extensione, partim repletionem. Hacque est ex spe-
ciebus Apoplexie gravissima ac ejusdem nota, sive
illa, sc. repletio a materia calida, sive frigida eve-
nit. Quae est sine Tumore, contingit vel a super-
fluitate in ipso cerebro, aut cavitatibus ejus, aut
in propinquis canalibus spirituum ex cerebro; est-
que hac superfluitas humor sanguineus subito in
ventriculos effusus, aut humor Phlegmaticus, atque
hanc superfluitatem nempe, est frequentior & Posterior:
vel accidit in canalibus spirituum ad cerebrum,*

dam interdum Vena & Arteria ex vehementi repletionis & abundantia sanguinis obstruantur, in Spiritum, sc. vitalem, transire habet, nec cunctantur, seu cessat indignari, seu turgere & effructuere: acciditque hoc, quod in ligatura arteriarum duarum Carotidum, seu Soporatum, cum amissione sensus & motus, contingit, & quando id simile obtingit a causa Primitiva, seu interna, effructum eundem producit.

The Physicians for many Ages since that in an Apoplexy, accus'd only the Straightness and Coarctation of the Ventricles of the Brain, distorting the Sense of the Ancients, and enrich'd their Opinion with the Fancy, that the Use of the Ventricles, was either to gather, & collect and distribute the Animal Spirits. But when that the *Paracelsian* Method in cutting the Brain began to be practis'd, the Ventricles were discharg'd from these Uses, by *Platurni*, *Basilii*, *Spigellii*, and others; but most happily by *D. Caspar Hoffmannus*, and had assign'd to them only the Office of Receptacles of the Excrements. Against him, the former Uses of them, the Famous Anatomist *Job. Riolaunus* still endeavour'd to maintain: The ground that his Argument proceeds upon is, That the Animal Spirit is made out of the Vital, and that this is conducted by the Carotid Arteries to the Basis of the Brain; and then that the Ventricles are aptly situate to this end, to receive and convey the Spirits into the fourth Ventricle as a Cistern,

that thence they may be distributed into the Nerves. And thence carries it on, *At Nervorum septem Conjugationes propagantur ab illis eminentibus quatuor, quarum duæ majores formant clauduntque latera Ventriculorum anteriorum; aliæ duæ constituunt latera quarti ventriculi, cuius tertiam partemque anticam & posticam efformat duplex Scolicoidis Apophysis.* And for the conveyance of the Blood thither, *Aperi mirabili numerosam subolem ramulorum arterioformum, undequaque per duram matrem spargi, qui sanguinem suum deprimant in sinum tertium: ab eo sinu depronant immenses rivulus, qui sparsi per exteriores abfractiones cerebri, roris instar, destillent sanguinem arteriosum superius decursum: præterea per torcular, venam magnam Galeni, seu sinum quartum sanguinem & Spiritum ad ventriculos deduci.* But all this with a violent Strain to Reason and Anatomical Truth, much Indistinctness and Inconsistency with himself; What means the destilling of the Blood, the Sponginess of the Emissaries that convey the Spirits to the Nerves? The Spirits sometimes confin'd to the Ventricles; sometimes diffus'd to the whole Brain. What else is his allowing the Ventricles to receive the Excrementitious Moisture, which he had separated for a nobler use; his deriving the Blood into the Plexus Choroideus, from the Sinus quartus, with the pernicious Consequence that would attend it if it were so. With other slips of this nature, *Est quæ præterea Spirituum Animalium apifæ effect in corpore, ex minoribus venulis*

*venulis & arteriis tenuissimis membrana & alijs glandulis composito? Unde suppeteret materia? Quae via distribueretur Spiritus in Nerves modo ipsi continui, quibus sedibus includetur, ut necessarium, huc illucve deprimendus? But in the Office of the Ventricle, and Seat of Animal Spirits, we receive better Information from *Hippocrates*, who against him argues.*

1. *Ibi se Spiritus ubi Alia.* At vero in corpore se. Corpus enim agit non accidens.
2. *Spiritus si agere debet, oportet sub imperio animae moveri, sc. in vasis.*
3. *Ventriculi cinguntur interius pia matre.*
4. *Ab exitu Spirituum in palatum.*
5. *Ventriculos cum Nervis non esse continuos, sed cum corpore.*
6. *Ventriculos habere aliud officium & incrementum.*

The Arguments are fairly laid down at large in *Wefferus*; and are nevertheless valid; though I see no reason altogether to be satisfied in the Uses here and generally assign'd the Ventricle, since as it is observ'd by that Curious Anatomist *Dr. Ridley*, no Water can be express'd from the *Glandula Pituitaria*, nor has it any aperture discoverable into the Palate, which confirms this, that he never found Water in the *Infundibulum*, either in the Sound or Unsound. For besides that, there is a Parity in the Reasons of the Use of them by him assign'd; on that well can be assign'd, the *Vesica* found in the Ventricle of virginous Cattle, and the great quantity of Water

Water, *In putris integræ mentis curia obnoxa*,
 mention'd by *Falsinus*, and cited by the foresaid
 Author, evinceth the Nobility of their Office.
 And *Galen*, whose Notion in this Matter is not
 consistent, yet relates, *Adolescentem Smyrnensem*
ad alterutrum utriusque usque vulneratum,
sanæ oculare visus, superstitem pertransisse. And
 again observeth, *de seporibus et Epilepsia ventris*
magis, corpus videri minus affici solet, in *Apo-*
plexia per corpus magis. And this easie to be
 clear'd in the Formation of Brains of Brutes.
Hesperus, by the help of Dissections, detects
 the Seat of this Disease in the Brain it self, con-
 sidering the whole Compage in Contradistinction
 only to the Ventricles, and asserts a true Apo-
 plexy to be generated, *Ab excessu Spirituum ro-*
tali ad instrumenta sensus et motus præparata, *quod*
fieri potest principii morbum Nervorum vel Obstructionem
vel compressionem subito factam, unde dene-
gatur Spiritibus Animalibus, quæ præstant
sanctæ, Apoplexia sequitur. And this Stoppage,
 according to him, may be either at the Pores of
 the *Medulla* that admit the Arteries, or are open
 to them; or those through which they are di-
 stributed into the Nerves. This Hypothesis
 labours under many Difficulties, suggested both
 from Reason and Experience; for as it is ne-
 cessary that the Seat of the Animal Spirits should
 be exempt from any forreign Intrusion, so Na-
 ture seems to have secur'd it, like the Palace of
 Princes, by previous passes. Neither does the
 Brain appear lyable to the Inconveniencies that

peller Secretory Glands are from their own Ad-
 dition, or Addition of less prepared or gross
 Juices, which procure their Obstructions. And
 accordingly we do not find, that a Colluvies in
 Serum, or a Strumous Brain to have induc'd
 this Distemper. And even in that plainer case,
 which is allow'd, where an Apoplexy proceeds
 from a Plethora, and a Weakness of the Brain,
 I have always found some further Explication
 necessary, as to account why so sudden, why
 not in all Ages and Seasons, and the like. And
 on the other hand, that the Brain cannot want a
 sufficient Afflux of Blood; Notwithstanding as in other
 parts, so here, such aids provided, as by And
 toffey appears. Our great Dr. Boerhaave hath in
 my Judgment clear'd this Point, by two in-
 stances, one of an Obstructed Artery, without
 an Impediment to the Course, or at least a suffi-
 cient Afflux of the Blood; The other of an Apo-
 plexy, without any appearance of Obstruction
 or Disorder in the Brain. And more closely tra-
 cing the Seat of this Distemper to the Origin
 of Sense and Motion, hath fix'd it in the *Medulla*
oblongata. And besides that, there is the
 Spring of Life, there is good reason to excise
 the Cortical part; since Instances are frequent
 in Authors unquestionable, of Persons of a
 taken out of Wounds of the Head, without
 any pernicious Consequences. And therefore
 whereas Dr. Eustachius is pleas'd to suppose, that
 the Seat of the Distemper, is where the Cause
 and necessary occasions the Defection of the
 rures

times due Affairs first since it self; I do not see
 it essential to this Distemper, to be an Affection
 of this part; but with deference to that very
 Learned and Excellent Physician, must observe
 that the Enemy sometimes escapes this Secre-
 tion, without leaving any marks of its footing;
 and therefore am inclin'd with Dr. Willis to
 place it *In aut prope cerebri Medullam*, upon
 the entrance of which it exerts its power. But
 if he pleases to consider the Cortical part as it
 is Secretary, and as it is first affected in a gra-
 dual or habitual Apoplexy, I think that must be
 allow'd. Dr. Willis then proceeds to induce a
 Prostration of the Spirits, to solve the sudden
 and light attack of this Distemper. An Apo-
 plexy he distinguisheth into Accidental and Ha-
 bitual, which he considers *sive Procatarxi*, or
 with an Antecedent Cause. The *Causa con-
 juncta & proxima aut est magna Solutio con-
 tinui alicubi intra aut prope cerebri medullam
 contingens, propter quam, pars obstruitur aut com-
 pressa, emanatio omnis supprimitur, vel est ingens
 ac subito spirituum in Cerebro degentium proflig-
 gio aut extinctio*. [Another Species that may
 be temporary, he supposes an Affection of the
 Cerebellum.] The *Solutio continui* is either
 from Blood, an Aposthem, or 3ly, a Serous
 Colliquo. The reason of an Extemporaneous
 Apoplexy, he assigns in the Conjoint Cause,
*In Parenchyma materiam congestam in ambitu ce-
 rebri prius aggestam & dispersam demum in Me-
 dullam ejus descendere, ibidemque spiritus omnes*

adoriri & in ipso emanationis sue fonte sup-
 mere & prostrare, ut si non plane constaret, utrum
 illud esset aut medulla poros tantum insarcienda,
 aut Spiritus istas profluendo isque narcosis infl-
 gendo, utrisque utroque modo. His Proca-
 ctis. Sanguis in visio vel cerebrum in crass inte-
 cillum & secundum poros & meatus ejus latens
 & solutus vivis, materiam morbificam absque
 repudio admittit. That happy Author, the
 above mentioned Dr. Cole, in his Treatise occa-
 sion'd by the late Frequency of Apoplexies, by
 his Inquiry into the *Materia Morbifica* indolent,
 hath not a little illustrated the Cause of this Dis-
 temper. His Sense, as I understand it, is this,
 From Observation made of the Weekly Bills of
 Mortality, he dates the Era of their Increase
 from 1683. Upon which *Substratum* he naturally
 deduces the Cause of this Distemper from Cold,
 and observes that to account for it very well.
 In order to the understanding the Nature of
 Cold, he reduces the Notion of it to these Con-
 siderations.

1. That Sensible Qualities, though they are
 not among the general Affections of Matter, as
 Motion, Rest, Bulk, Figure, &c. yet are con-
 sequent to it, but determin'd by these, and asso-
 ciated to somewhat that has Perception.
2. As Cold makes an Impression on our Sen-
 sories, so it requires Motion, and it is not Mo-
 tion simply, but consider'd with some adjunct,
 viz. Motion in such or such a Degree, and with
 relation to Sensitive Beings that constitutes Heat.

3. The

3. The Transmission of these Impressions to the Soul, requires a Motion in our Organs, but such a one as may keep up a due Crisis in both the Fluid and Consistent Substances, that make up the Organ for the performing the Functions appointed.

4. That these Congenial Motions seem not properly Objects of our Perception, but rather Instruments of Transmission of those others from without, which recede from these Degrees, or are otherwise Circumstanced: Though these defecting from their due Proportion, may, by affecting the Soul differently from what they use to do, excite her to take notice of them too.

5. That these mean Motions are to us a Standard of all others.

From all which, our Author deduces Cold to be a Check of that degree, which belongs to the Parts of, and Fluid Substances in our Sensories of Touching; and Heat to be an Acceleration; and the Bulk and Figure of the Bodies that cause either to be considerable. The Retardation which makes the Nature of Cold, may be occasion'd by increase of bulk and change of Figure, by Adhesion. 2. By altering the due Contexture of the Vessels. 3. If the affecting Bodies be of such a Figure and Texture as to be flexible. 4. By Interposing they may fill the Spaces, and may be the present Case. Now as Conical or Pyramidal Figures solve this Phenomenon best, so he gives the Nitrous parts of

of the Air those Figures, from *des Cartes's* Notion, and *Leuwenhoek's* Microscopical Autopsy. To enquire how our Bodies and Brain are affected by these, he observes the Air to affect as follows,

1. The Blood, into which it is admitted by the Stomach, by the Lungs and Pores of the Skin; and on which it operates partly by the Infusion of its Elastical and other Irregular Particles, partly by the Interposition as well as Laceration of the Nitrous Rancous Parts, which prevents the Coagulation of it, whereby the Crass of it may be alter'd, if such Air be admitted as shall over-check this Agitation.

2. The Nervous Juyce, which he supposes lyable to Impressions, in some degree analogous to what are made on the Blood from Substances mix'd with it. He supposeth some of the admitted Substances of the Air may be deposited into the Nerves at their Original; or that it must communicate with the Blood, in receiving some of the Viscous parts produced in it by the Air; and that some more subtle Particles must be admitted through the Pores. To which the first worthy Author adds, That he conceives there is some due Proportion necessary to the due Spiritualization of this Juyce. Again, The solid parts are lyable to the same Inconvenience, and so retain them longer.

Lastly, The Brain may be affected not only by the Mediation of the Blood, but also by the Air affecting the Mammillary Processes, or the Ears,

Ears, or the Extremities of the Nerves in all parts of the Skin. And this pressure of the Air may be unequal, some part of it being mov'd with greater Violence, where is greater Dilatation, or a part kept warmer: And this Injury of Air, Tenderness and ill Digestion, through want of Exercise, makes the Body obnoxious too. And thus the Brain may suffer in that Continuity, due Confirmation and Repletion of its parts, wherein this Author supposes the tone of the parts to consist. So that in the Author's own words, as well as Sense, The part affected may either be the whole Brain, or any considerable part of it, and either the Cortical or Medullar, but especially (or at least first) the Cortical, from whence the disaffected Matter is transmitted to the parts of it which lye deeper, where the Animal Spirits principally exert themselves; the Nature of the Distemper to consist in the sudden Abolition of the due Exercise and Distribution of the Substance; the immediate Cause, most usually (when unavoidably fatal) an Effusion of Blood out of its Vessels upon the Substance of the Brain, Though I conceive (says he) that Dilatation of the Arteries there may occasion it, or also any perhaps Congestion of Viscid or Serous Matter, when it comes to a considerable degree, and becomes freshly coagulated; or else Polypous Concretions, or (if we can suppose it) any other obstructing Matter deposited in it may at last produce it; and the true disposition of the Brain to it, to consist usually

usually in the more than ordinary Laxity or Openness of it. And whatsoever either first causes a Congestion of Blood, or any, otherwise so Indisposes it, that it cannot readily and duly circulate through its usual Vessels in the Brain, or any, disaffects the Brain, whether by weakening its Tone, or altering the Figures of its passages, or straitning them too much, may occasion Apoplexies: And the greater Urgency or Violence of such antecedent Causes, may introduce a greater Frequency of them than ordinary.

Thus I have given the Notions of this Distemper distinctly, for these Reasons;

1. It sets the Distemper, as we do a Picture, in all Lights, to try which way we may see it best. And,

2. As it prepares to the understanding of Apoplexies, so in my further Inquiry, in many particulars, Repetition will be saved, and less intelligible Parentheses avoided.

3. We may, by this means, observe the specific Symptoms of this Distemper, and see what hints they gave these Authors.

Information being not to be bargained by Controversie, I shall not inspect the Particulars of these Accounts, in which they are not satisfactory, as why, after that Frost, and not preceding ones, why the Era should be then fixed, and yet the Incurse began long before. Why the Head should be affected, and not other parts rather; it being necessary to account for the

Reason,

Reason, why Air afflicts one part particularly, as we see the Fauces and Throat at the *Alps*, the Lungs at *Rome*. So likewise of the Changes of the Distempers which are temporary, and many other things; but shall offer some Observations, which I submit to the Judgment of the last cited Author and others, which, if approv'd, give a more natural account, and may carry on the Inquiries; and they are such as answer two Questions or Inquiries.

1. Of the Reason of the sudden and accidental Death.

2. That may inform us of the Indoles of the Morbifick Matter, and how much is observable in the Air that can answer for this.

My Notion, as to the first of these, is deduced from these Considerations.

1. That the Motion of the Blood is necessary to Life.

2. That this is owing to Respiration.

3. That Respiration is necessary to Life.

4. Both Motion of the Blood, and Necessity of Respiration, consist in the Elasticity of the Air.

5. I observe, that besides the Atmospheric Air, that is exhausted by a Pneumatick Engine, there is a finer Elastick Air or Matter contain'd in this Atmospheric Air, which in an exhausted Receiver hindred the parting of the Marbles, which is Elastick too, the pressure being ad-
justed, or in Proportion to the force that is
capable to separate the cohering Bodies,
and

and may be surmounted by a force superior to it.

6. There seems to be a Nitre in the Air necessary to maintain and share in producing the Elasticity of the grosser Atmosphere, which being consum'd, an Animal dies.

7. There are certain *Termini & fines* of the Tenuity and Grossness of the Air, on this side of which, or beyond, the Air becomes unfit for the Respiration of Animals. Thus Fish that die in an open Air, yet are choak'd for want of it, if a Pond Freeze; and accordingly are provided with Pipes, that strain the Matter, and are stronger, and not lyable to the Inconvenience from the force and weight of the Water. And lastly, as the Matter drawn is finer, so there is no need of the Contracting and Opening, or Conquassation of the Air, to get the Matter out they want, which is strain'd by the Water.

8. I observe, that Animals which have a Crasis of Blood, to which less Nitre is requisite, as they can be long without Food, so can live a considerable time without Air, as *Tortoises, Adders, &c.* and therefore have membranous Lungs, in which no more Blood circulates, than is required for their Nourishment, and so not the whole Blood, as in those that have fleshy Lungs.

9. This Elasticity is requisite to Life, as it keeps in a Springy Motion, and so Life ceases, either upon a Stoppage of the Air Externally,

as in a Glass, or Internally, as we see is the Effect of Damps, which by some, and these great Men, have, by mistake, been conceiv'd to contain Poysonous Matter, and to perform it on that account, but the contrary is evident, since in Pump-wells the Water is wholesome, and a new built House, from the Lime and Mortar, shall have the same.

10. On the same Reason, Animals dye in the exhausted Receiver, upon the unbending the Spring, by Exhaustion. And it is worthy remark, that Animals taken out before expiring, are not recover'd by admission of the Air, which affects not soon enough the lesser or remoter Springyness. *Acad. del cimento.*

11. That the Parts and Juyces of Animals are Elastic, appears to me asserted in the Experiments of the Honourable Mr. Boyle.

12. That Air is admitted to the Blood, I need no other Argument, but that the Blood continues to follow upon Bleeding.

13. That the Air is not admitted to the Brain and Nerves, or to any of the Specifick Juyces of the Animal, I argue again from the like reason.

From all which I deduce, that an Apoplexy is produced by the admission of Air, or Elastic Parts, to the *Medulla* or *Corpus Callosum* of the Brain. And that this Air and Lethiferous parts are admitted by the Mouth, and so by the way of the *Stomach*, appears plainly, in that the Fits usually seize immediately upon plentiful Feeding.

For

For the Glutinous parts of the Chyle are a Vehicle, as being, if all concocted, Flammable and Elastic, as I shall farther demonstrate, when I come to the *Affectio Hypochondriaca*.

And I must take notice of the Consistency of this Notion, which is confirm'd by that Affection so often passing into this Distemper.

That this sudden Death comes not from the other Causes I named, is evident from many Reasons, which I have not room here for. The most difficult Phenomenon to be solv'd, that appears to me, is the Apoplexy seizing *Fanella* upon the difficulty of Eruption of the *Catamenia*, at the second Septenary. To which we can only say, that the *Plethora* is apparent, and the Weakness of the Brain, though we see not how the Brain, and *Genus Nervosum*, is concern'd in this, nor know its Motion; for I allow the antecedent Causes of a Turgid Blood, and a weak Brain, to have place in this Distemper. This my Hypothesis, I think, naturally consequent to the just Notions of the Air and Brain, and well accounts for the *Spuma* at the Nostrils and Mouth, and for the Difficulty of Breathing, or Cessation of Respiration attended with an entire Pulse, which thus may be carried on, and the main Design of Respiration cease. This gives the reason of the Distention of the Lungs in the Apoplectick that is mention'd by *Wepferus*, if the Elasticity of the Internal parts of the Lungs, can but be supposed to do the same that the removing of the Incumbent Atmosphere

Atmosphere in an exhausted Receiver did on some Animals, in which the Academy del Cimento observ'd the Lungs to swell, and to Froth at the Mouth: And thus we may solve the Difficulty observ'd by the Ancients, why this Distemper affects only the Chest or Breast: The only thing that we want to be satisfied of is, secondly, what that is in the Air that induces this Distemper: now to be so ripe, whence we may come at the *Indoles materia morifica*. And that I may not enter into that vast Field, of the Cause of Seasons, and the like Effects, which are taken into the Hand of God's particular Providence to manage, I shall confine my self to be guided by these few Remarks:

1. That no Affections of the Air, or Qualities in it, depend on any Mixture of Mineral Vapours, because they precipitate immediately; neither do we find the places where are large Eruptions of them, any whil Sicklier, or affected, otherwise than other places: And then, all Distempers are otherwise Solvable.

2. That the Qualities of the Air, that affect our Bodies, consist not in, nor always with, those that may be supposed to belong to the grosser Air of our Atmosphere. I have known Animals frequent some Years in a hard Frost, which would be suppos'd to be pernicious to them, and nor only my self, but that most extraordinary Naturalist, and universally great Man, and my honoured Friend, Mr. Ray, hath observed;

observed, that some Years the hardest Frost hath not hindred the Papilio's from coming out of their Chrysis, which in some mild Springs, shall not be found abroad so soon. This is the more fit Instance to prove what I say, must be acknowledged by any that have observed the necessity of Heat, and how much it contributes to the Production of this Change.

3. That there are some Qualities in the Air always, which are owing to the parts more intimately mix'd with it, than is the Nitro, that affects us with Cold, and which passeth where the grosser is not admitted. This is observable in the Effects it has on Liquors, which the Managers of them are forced to have recourse to, for the reason of the Disposition to ferment, or fret, or Incapacity of either, Acidity and the like. All which some Years, Liquors, especially Cyder, is propense to, be the Weather what it will.

4. That Heat and Cold, Wetness or Dryness of Seasons, assist in inflicting a Disease, as they may help admit these Particles.

5. That I have observ'd these Qualities of the Air to be Temporary, and the Diseases effected by the Air to be so too, and that in their Continuation and Variation they usually observe the Direction of both Causes, the Nature of the Humour in succeeding Distempers being usually traceable, as the Variation of it is likewise accountable.

Now although I can by no means maintain, that the Hypothesis of that Learned and Ingenious Man, agrees with the Rise and Continuance of this Distemper, or is sufficient to explicate it, nor can answer for the Non-appearance of the Distemper before upon the same occasion. Yet that it was a fair offer at the Truth, and affords a good hint, is remarkably to be taken notice of, in that this Winter, in which more have died Apoplectick, and that in the Country, than ever was taken notice in Man's Memory, or deliver'd to have been in any Age; I say that this Winter should be, though not the hardest, yet remarkably long, does seem to make the Nitrous Air, a sharer in the Cause. But as I except against the Explication of this Distemper, by bare Obstruction or Stagnation from Cold, as not sufficient, so I come now to inquire, what farther knowledge of this the Air will afford us, assisted by the preceding Considerations, and to see how they answer here, and how far the Footsteps and Changes are discoverable. And as Truth is not surely to be laid hold on, but when pursued by a natural Method, so I wave all Hypothesis, and only propose this Maxim or Rule to direct me, which I take to be too necessary a Deduction, to be deem'd a begging of the Principle. The Air that is productive of a Distemper, must produce some other Effects in differing or less prepar'd Constitutions, and not hit only where it can fully execute; and the Disposition;

Particles, or Qualities of the Air may reasonably be inquir'd of these Effects, as Prints of its footing.

The Diseases then that have been inflicted by the Air this Winter, have been Feavers [which I shall say nothing more of, than that the Heat was gentle, that they were Putrid, and had putrid Pains in the Sides and Limbs, and that they affected the Head] or ulcerating Colds, so I name them, being of two sorts, the first violent Fluxes of the *Alum*, and *Catamenia*, the other *Ophthalmys*, which wore off in three weeks time by Suppuration. And lastly, The Small Pox, which appears here a mixture of the preceding Distempers, or Qualities in the Air; for the Air here gives these remarkable Dispositions, 1. to Corrode, 2. to attenuating, whereby the parts seem to pierce to the Eyes and Bowels. 3. To Flatulency, all which include a tendency to flow. Which Qualities, as with many reasons I concluded to be Nitrous, so Vitriols mortified or resisted; and even those Fluxes of the *Catamenia*, which in another reason Steel is observ'd to raise and increase, submitted only to the force of the same Mineral; which I was directed to by some further Observation of the Air, which is too long for this Discourse: Though the increase of some Fluxes of this kind, upon the taking *Sal Prunella*, which usually gives a present check, is enough to advance such a Hint. The last Year, viz. 1697. entred attended with a particular sort of Colds, that

that induc'd an irregular Feaverishness; with milinary Pimples spreading upon some particular places of the Body, so close and so small, as to resemble a stain of Claret or other Scarlet Liquor; which superceded by Tumour of other parts, and Sickness, in some prov'd Mortal. At the same time another Distemper was found invading, though Sparsim only, which began about the *Michaelmas* preceding, and continued to the middle of the last Year, which first invaded the Patient with want of Rest only, and unsaptness of the Brain for it, wherein the Patient that was entirely well up, and had no complaint, but upon lying down and disposure to slumber, was sensible of such Distraction and Uneasiness of the Head, as oblig'd him to fly up immediately. This Distemper continuing, brought a Cough without raising, and a sort of an *Ictericia*, with Shortness of Breath, and frequent and sudden Apprehensions of a *Deliquium*. The Year 1696 enter'd with the same sort of Colds, and with the Spring brought Epileptick Distempers, which wore off with Scabbiness; and many People, Young and Old, were surpriz'd with Vertigo's; and others with Tumours in the Throats, and corroding Ulcers, curable by Astringents only that were Vitrioline. In 1695 *Deliriums* were frequent. In 1694 Feavers that seem'd to have their Seat in the Glands, and were attended with great Acidity of the *Saliva* or Liquor of the *Tonsilla*. And from three Years before reign'd Nervous Rheumatisms,

matisms, a Distemper very unusual, from the acuteness of the Pain; the mortal Consequence of them, and the puffyess of the Tumours, very remarkable: This Disease hath continued hitherto, but abating.

I engage not my self to solve or account for all these Changes of Diseases, or the reason of them; it is sufficient that none of these Cases were attended with any apparent Fever, the Matter was in all seated in the Membranes, the part affected in all was puffy, the Distempers frequently chang'd one into another, affected the Head and Nerves, cur'd by the same means, which were Vitriolick, and were admitted by a wet Constitution of the Air. So without making inquiry into the Origine and Commencement of this Disposition, and Reason of it, it is sufficient that I illustrate the Seat and Nature of this Distemper, and I think I must be allow'd that these Diseases proceeded from the same common Cause and Humour, and were transferrible into each other, and have liberty to conclude first, That this Peccant Humour was seated in the Membranes. 2. That it was stultent, and had a stultent Acidity. 3. That the Matter was Nitrous. Neither think I my self oblig'd, to account for the Determination of the Seat of this Humour, or the reason of taking Cold, but shall from the evident Causes, Matter and Seat of it, infer,

That

That an Apoplexy is a sudden Deprivation of Life, by admission of Airy Elastick Parts into the *Caudex Cerebri*, together with Thick and Turgid Chyle, and is owing to a Corrosive Nitrosity and Fluor of the Blood, and Weakness of the Vessels, or containing Parts of the *Caudex* affected by Cold, the way being first forced in the anterior part of the *Cortex*.

I think this a sufficient Notion of it as a Disease, but contradict not the difference that must be made of Apoplexies inflicted by Force, as Drinking, &c. or gradual ones.

Having thus fix'd the Nature of the Distemper, the Intentions of Cure are drawn from the Morbid Dispositions, which are,

1. Nitrosity of the Blood, which indeed is the Reason it is so very Florid in Apoplexies; and to this is owing its Fluidity.

2. The Weakness of the Vessels from Cold received by them, and by this I understand a Clog of a disabled Serum, considering the Nature of Cold in gross, as separating the Juices, and so mortifying them, as to put them past Reduction.

3. The Exorbitancy of Chyle, that maintains and conveys Elastick Flatulent Parts.

All which indicate the Astriction, and other Qualities I observ'd before to be in Vitrioline

Waters, and the Requisites that capacitate them for all this, are in full Virgue only found in this species; where the Astriction is strongest, and the quantity of Steel not so considerable, as to increale the Heat or Turgency of the Blood, in both which this kind exceed the other two; though I cannot but judge, that a Promission of the thin light sort, may in some cases assist in more effectual preparatory Cleaning the Brain, and be very properly directed to precede: indeed the *Hypochondriaca Affectio* does so often dispose to this Distemper, that as it will confirm much this Account, so will much recommend this Method. It does not belong to this History, to deliver an entire Process or Method of Cure, nor am I so opinionated of my own Ability, as to prescribe it to others of my Faculty; yet because this Discourse may come into other Mens hands, that may judge this Digression Fruitless, without some Improvement of it, I shall for the sake of the Fury and Suddenness of this Distemper, give some Observations of mine, that may help to occur or prevent it, or assist, at least, in shortning the Process, and fit it for an Extemporary Occasion. And though as Cases may much differ, so a *Plethora Sanguinis*, *Colluvies Serosa*, or Viscous Phlegm, Obstruction of the *Catamenia*, and the like, is to be consulted when they are in the Cause; yet the checking the Fury of the Blood, as well as clearing the passages to the Brain, is best perform'd by Chalybeats,

lybeats, and to more good Effect, than by Bleeding, &c. and differ not so much in the Cure, as they seem to do in the Cause; and my Observations I shall deliver briefly thus.

1. That for Prevention (besides the removing any known Cause or Occasion) the best Deobstruents are such as joyn and mix with the Matter they are to exterminate; of this sort is *Sapo venet*, and *Urinae humane*, or perhaps of other Animals; and these to be promoted to the use of Chalybeat Astringents, where these Waters claim their place. Only I must mind the Reader, that if such a Relaxation of the Vessels of the Brain attend it, as appears by preceding vertiginous Warnings, I must after the use of the Waters, dismiss the Patient to Mr. Boyle's *Ens*, which in the preceding Distempers of the Membranes of the Brain, I have experienc'd to be most Effectual.

2. As the other Method is to prevent and restore, so for the present Relief in the Assault, Emericks and Catharticks usually distinguish themselves: The other general and particular Evacuations fall not under my Cognizance, writing a System being not my design, yet Sternutatories must not escape my Reflection, which I have ever observed to hasten the approaching Death, to which the Nature, as well as the Violence of the Motion made by Sneezing, dispose them; and are fit only to put the Patient past Remedy with speed. And as this Motion is necessary here, so a due Caution about Diet,

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Diet, which forbids eating Pork, or Eggs, or Meat of thick, high and flatulent Nourishment, is necessary to be observ'd with respect to Prevention. Other Particulars that regard the Constitution of the Patient, or Predisposition to this Distemper that the Physician is to judge of I ye not here before me. Thus much as to the Apoplexy.

There are many other Distempers, where a Water of this kind is peculiarly proper to master and remove flatulent and viscous Matter, and to curb the Turgescence of a florid Blood, as in the Cephalick Disorders of Elder Women, &c. and that I may not proceed upon Suggestions of Reason only, I shall recite the Virtues of *Knaresborow* Water from the Observation of Dr. French, in his words.

‘ This Water Cools and Moistens actually,
‘ Heats and Dries potentially, and according
‘ to other Qualities, second and third, it cuts,
‘ dissolves, attenuates, abstergeth, viscous tartarous Humours in the Stomach, Mesentery,
‘ Hypochondries, Reins, Bladder, &c. Penetrates, Corroborates, Astringeth, &c. It
‘ allays all acid, gnawing and hot Humour,
‘ and Cures all such Symptoms as proceed from
‘ thence, as Agues, Consumptions, Quinsies,
‘ Tumours, Imposthumes, Ulcers, Wounds;
‘ it stops Bleeding, the Over-flowing of Choller,
‘ the Dysentery, and such like Fluxes.

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It Corroborates the Brain, Nerves, &c. and prevents or cures the Apoplexy, Epilepsie, Palsie, Vertigo, Invertebrate Headach, and Madnes; and all such Symptoms as proceed from the Weakness, Coldness, Heat, Dryness or Moisture of the same.

It Corroborates the Stomach, and causeth good Digestion, consumes Crudities, which are the Causes of Obstructions, and breed ill Blood and infirm Flesh, or an ill habit of Body; it maketh the Fat Lean, and the Lean Flethy; cureth and preventeth the Cholick and Worms.

It strengthneth and openeth the Lungs; Liver, Spleen, Mesentery, and cureth difficulty of Breathing, the Asthma, the Drop sic, Melancholly and fearful Passions, Hypochondriacal Wind and Vapours (offending the Head and Heart) which most Women and many Men are afflicted withall. It doth also upon this account clear the Heart, cure and prevent the Palpitations and Passions thereof, as also all Faintrings.

It purifieth the Blood, cures the Scurvy, even in those whose Teeth are ready to drop out of their Heads, by reason of the Extremity thereof; also the Foul Venereal Disease, Leprosie, Jaundies Yellow and Black, and for the more perfect effecting of these Cures, it doth in many open the Hemorrhoids.

It provoketh Urine, and cureth the Suppression, and allays the Sharpness thereof;

it

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It provoketh Urine, and cureth the Sup-
preſſion, and allays the Sharpneſs thereof;

it

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it diminisheth the Stone in the Bladder, by dissolving the soft Superficial parts thereof, and evacuating that mucous slimy Water in which it is involved, and by this means also it prepares it for Cutting, for sometimes this Stone cannot be felt, by reason of that slimy Mucous, which Mucous it self doth also sometimes, by its Torments, counterfeit the Stone, where it is collected in a great quantity, being of an acid tartarous Nature. It forceth out from the Kidneys and Bladder abundance of Sand and small Stones to a great number, and sometimes such as are as big and as long as long Pepper. And as it cures all Ulcers and Wounds in the Body, so especially, and much sooner, in the Reins and Bladder; suppressing also the Pissing of Blood, and the Gonorrhœa. It cures the Gout, Aches, Cramp, Convulsion in what part of the Body soever, and giveth ease therein suddenly.

It openeth all Obstructions, and suppresseth all manner of Over-flowings in Women, strengthneth, cureth the Mether, maketh the Barren Fruitful, and is a great Preventative against Miscarryings, and rectifies most Infirmities of the Uterus.

Note, That this Water doth not help all parts, cure all these Infirmities, after one and the same manner, some being reliev'd by consent, or by removing Obstructions of other parts. It is also used by way of Inseffion in Griels of the Womb, and by way of Injection
into

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into that, as also into the Bowels and Bladder, where all the Qualities act immediately upon those parts; allay the sharp and hot Distempers, mitigate the Pains thereof, Healing and Corroborating the same.

It may moreover be used by way of Emolumentation and Lotion in external Wounds, Ulcers, Itch or Scabs, and being drop'd into Sore Eyes wonderfully cooleth, dryeth and cleareth the same.

In a word, If any Intentions in a Medicinal way, be to be perform'd by allaying Distempers, opening Obstructions, evacuating superfluous Morbifick Humours, and Corroborating all the parts of the Body, those are effected in a very good measure, if not fully and perfectly, by this Water.

And I my self have seen many of the aforementioned Diseases cured by the help thereof; and for other Cures effected thereby, I have been assur'd by them themselves who receiv'd the Benefit, onby others who have been Eye-witnesses of the same. Thus far Dr. French.

To the right understanding and due use of all which, I shall observe, That the Cure of the Foul Disease can be suppos'd to be put partial; unless that Distemper be taken in a less strict Sense; and passing the Notion of Diminishing the Stone, which I had rather express by the preventing the increase of its growth, I shall for the fixing Experience right, make
this

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this Remark, which may be usefully apply'd to all the Waters, which is, That in some Distempers (as Dropsie, Convulsions, Jaundies and Gour) constant Success and entire Cure is not to be expected, without regard to the State of the Disease, the Age and Firmness of it, the Cause of it, and the Distemper complicated with it. Thus a Dropsie may not submit to this Remedy, not only from the Firmness of the Obstruction, but also from the Constitution and Laxity of the Patient, from the nature of the Disease, (which I have observ'd sometimes to be from a Weakness of the Membranes, by Flatulent Matter contain'd in them) or from the Disease inducing it. Convulsions here have remedy only adequate to the Cause, be it a flatulent putrid Matter (which usually gives the Distemper the Denomination of Worms, from the effect of it,) or be it from Melancholy Hypoch. and Vapours Hysterical: But if seated in the Brain, or supervening an Ague, or in a cold Constitution, I think here can scarce have a proper Remedy. So the Jaundies I acknowledge have been often cur'd by these Waters, and some of the Purging ones, when it ow'd its Rise to an Obstruction of the *Catamenia*, a Clog of Phlegm, or uncocted Chyle, or Melancholy, but I must not allow these, or any Waters, to cure this Disease *de Essentia*. I think this Caution necessary to the understanding the proper Use of these and all Waters, which by the help of
this

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this may be distinctly known, and is of the greater Importance, since upon many accounts Empirical Use of these, and all other Remedies, is found to be of Fatal Consequence.

The Virtues of the Atramentous Waters.

THese Waters, though they have the same Virtues with other Chalybeate Waters in some degree, and create an Appetite, and wash the *Viscera*, yet penetrate not so far, open not Obstructions so well, but are apt to raise a Heat in the Blood, disagreeing to the design'd Effect, have not that Acidity, nor calm Astringence. These enrich the Blood, and where that is necessary, and Obstructions remote do not contraindicate, may happily be us'd; and in the Stone are Competitors with others. *Agricola* concludes these Effects, as in common with other Vitrioline Waters. To cure Corroding Ulcers, Ulcers of the Bladder and Kidneys, in the Mouth, Weakness of the Nerves, a weak Stomach they help: And they may be used Internally and Externally. But in Gout, Stone, or in Obstruction of the Glands, and smaller Vessels, are not to be used without Danger or Inconvenience, so not in Hypochondriacal Cases. These are valuable
in

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in proportion, as they are rich of Steel, keep it long, and have little bulk of Salt.

The Virtues of the Light Chalybeat Waters.

THE Extraordinary Virtue of this sort consists in, that as the Chalybeat Principles are in these most clean, so the Spirit most thin, and the Water both light and thin. And so we have their Virtues not only most full here, but somewhat differing: They invigorate the Blood without Heating, penetrate farther without Inconvenience, Volatilize, Attenuate more, and their Acidity goes off without leaving impression behind it preternatural. Thus as the heavy Waters that contain less of the Steel, and whose Acidity is of a more fix'd Nature, have a peculiarity of Astringing without Heating; so this sort are extraordinarily qualify'd for opening Obstructions, but seem not to have the same power of Astringing in an equal degree: And on this account they do not mortifie a Scorburick, Leprous Humour or Itch so well, nor are so powerful to stop Fluxes of Blood. I think fit to observe these different Effects, which being remark'd, I refer the Reader for the reputed Virtues of these Chalybeats, to the Virtues of the *Knaresborow* Water. I shall therefore pass on to examine what

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what Obstructions they remove, which I shall do, by exhibiting only Histories of my own Observation; and from thence further to enlighten the use of them.

Among the Cures of this kind, none is more familiar than that of the Stone, by removing the Disposition to the Generation of it, and restoring a good habit, as well to the whole Body, as to the parts immediately concern'd. And although this Cure is perform'd by a timely Precipitation of the earthy parts out of the *Lates* and Juyces of the parts, and restoring their natures; and so is owing to the Qualities that these Chalybeat Waters seem to enjoy in common; yet the fineness and penetration of this sort of them, must be allow'd an extraordinary Qualification.

But the Obstructions that I principally intend here, are such as yield to no other Remedy, so constantly at least; and whose fatal Consequence gives these Waters an inestimable value. Of this sort, I reckon first an Obstruction of the Glands of the Mesentery; wherein, beside the sign of Chylous Excrements, and rejection of Food an hour or two after eating, the Patient complains not of want of Appetite, discernable Feaver, or pain, or other disorder, till Feaver, Cough, and want of Rest (which last often precedes) proceed with the Emaciation upon the continuance of this Disease. Of this I have found *Tunbridge Water* an effectual Remedy, and

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most constant, never failing those that I have known to have try'd it, who have been not a few. And the small Spring at *Helfstead*, I find avail with equal success.

An Obstruction of the *Thymin*, which discovers it self by pain at the Breast, chiefly upon the Foods arrival at the place of its seat; which upon the increase of the Tumour of this Gland, resists the passing of the Food into the Stomach, and makes the Patient reject it, at least as soon as the *Oesophagus* is a little fill'd; is a Disease of equal consequence with the other, and which I have known these Waters speedily cure.

Another Disease from Glandular Obstructions cured by these Waters, is the Dropsie, a Cure of which is taken notice of by Mr. *Boyle*; but the Design of these Observations, being to form an Experience, that may be distinct, clear, and not fallacious, I must add, That the Effects of the Waters in this Distemper, fall not under so single a consideration as in the other, but that there are so many requisites in the Cases where these are proper, as make a good Judgment necessary in the use of them, and forbid the drinking of them without good Advice. For although I have reason to believe them to be constantly effectual, timely taken, by those whose Constitution was broken by trouble, and perhaps to be the only Remedy; and likewise in a Phlegmatick Constitution; yet not only the seasonable and
timely

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timely taking of them is to be consulted, but a Crasis of Blood, that needs not invigorating, does sometimes receive damage by them. And this I speak not by rote, but have known some *Quin Famina quinquagenaria*, florid and lively, that the drinking of these Waters have affected with a beginning Dropsie, the nature of these Waters (being to invigorate the Blood, and produce the *Catamenia*) was so differing in effect. And in a Dropsie that proceeds upon an Asthma, in a person of a florid sanguine Complexion, either a Chalybeat Water of greater astringency, as the *Knaresborow*, and that has least Steel; or else a Chalybeat that Purges, as *Scarborow* Water, is much more proper.

I proceed to remark next, the like extraordinary effect of these light Waters in Distempers of the Stomach, the pain by which they discover themselves is most exquisite. A painful Tumour of many Months at the pit of the Stomach, and reputed Scirrhus, I knew reliev'd and quite remov'd by *Tunbridge* Waters. I might instance in other Flatulent Distentions of the Stomach, and question not but they might be used with success in Ulcers of the Stomach, though in them I have not known these Waters made tryal of. But the most common Distemper, or rather Symptom of the Stomach diseased, is known only by the name of Pain. It is necessary to distinguish the kinds of this more nicely than is usual,

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and I shall not inquire here into the particular seats of it, but mind the Reader in general, that by the name of this Distemper, I understand an affection of the Stomach or Ventricle, from Matter lodg'd in or near it, excepting those Affections of it, *per consensum*, from the Head, or in acute Diseases; and so it includes the primary Distempers of that Region, that produce pain in the Ventricle. I fancy a *Syllabus* of all the Affections and Symptoms of this kind, would be useful, and might be instituted after this manner.

Though the pit of the Stomach has the greatest sense of the Pain, yet this Pain may be all over the Stomach.

So an obtuse Pain with Faintness and Sickness, and an *Hemicrania*, signifies a watry vaprid state of the Blood, as in a *Chloresis*.

The same with Sickness attends a full Dropic.

A rending Pain with weakness, follows great Evacuations in weakly Bodies, as Suckling.

Shooting to the Back, denote the matter to be windy, be it in the Cavity or elsewhere, and Cholicks vary. To say nothing here of Ulcers.

Moving a Rheumatism there fix'd, and increases immediately upon eating.

Pain moving and fixing in Spots, with most exquisite Pain, Coldness, and Convulsive Nippings, and working off with a Loosness, and coming some six or seven hours after, eating
ing

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ing a nervous Rheumatism, or rather Membranous.

This last again increases or assaults upon Cold taking, and is sometimes seared in the Coats of the Stomach, and sometimes in the Membranes adjoyning, or both; so in some I have observ'd it to strike from the Stomach in a Vein, as they call it, upward, side-ways, or the like; and not to bear a Position of the Body that pents it, for the part afflicted always seems pent.

An obtuse Pain contracting the Stomach, such as is usually express'd by knitting, attends Hysterick Fits.

An obtuse Pain without this, an Obstruction of the *Catamenia*; or a *Plethora sanguinis* in hot Weather chiefly.

The Ventricle may be affected near its upper Orifice at the Pit of the Stomach only, with a nipping Pain, or a knitting Pain, attending the Hypochondriacal; and an obtuse Pain, with a Sense of weight in Trouble and Melancholly.

The sense of Pentness accompanies Wind, the sense of Fullness, Water or Humour. So I might proceed to Soreness, Coldness and Acuteness, Faintness, &c.

There are other Pains near the Stomach, as in the Jaundies, about the bottom toward the right side, so in a distemper'd Spleen or Liver, or Pancreas, may be known by their Situation.

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Thus Judgment is to be made of the proper use of these Waters, from the Cause or Nature of the Disease; and of what means may reasonably be used together with them. For an Obstruction of the *Catamenia* may make that Remedy necessary that a *Plthora* forbids. A *Chlorosis* in a Phlegmatick Constitution is better cured with other Chalybeats, and a Pain from Weakness requires another Intention. So that the use of these Waters is to be confin'd chiefly to Pains Convulsive in the Melancholy and Hypochondriacal, and to other Collections of Wind or Phlegm from any Obstructions. And although these chiefly arise from the *Affectio Hypochondriaca*; and so are curable in the general Intention, yet greater Accuracy is necessary both to the Discovery of the Distemper, and assigning a Remedy, and without which, sure Observation can never be made.

Another Disorder of the Stomach, is want or loss of Appetite, which though it is restor'd by other Waters and means, yet not only is more fully recover'd by these, but its cause more perfectly remov'd.

But there are other Distempers cur'd by these Waters, which are less understood, and over which these reign alone. I shall instance in two, The one is a *Fistula*, which though of many Years standing, I have known effectually cur'd in six Weeks, by the sole drinking of *Tunbridge Water*. The other which

appear'd

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appear'd to me as extraordinary, was a Periodical Fever and Cough, which I knew a Gentlewoman cur'd of by the same Waters, who for many Years had never escaped an Assault about *October*, before she was freed by this Remedy. Obstructions of the Pancreas I should have named before.

The Virtue these have of Chearing the Spirits, and relieving a Heart oppress'd with Trouble, or tumultuated with any Passions, is as extraordinary as any of the former; as being indeed the Cause and Producer of the Glandular Obstructions, which together with Cephalick Distempers, as Giddiness, Pain, &c. come under the *Affectio Hypochondriaca*, which therefore I shall consider now distinctly in all its Symptoms.

The Affectio Hypochondriaca,

HAS very numerous Symptoms, and counterfeits all Distempers, and upon continuance brings almost as many. I shall consider the Symptoms, and then the reason of them, or seat of it. The Signs enumerated by Authors are, a Flatulent Stomach, ill Appetite and Concoction, Vomiting glewy peccutose Matter, the Stomach Flatulent, not well after Food; upon which came a rejection

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of Food by Vomiting; Lipothymia, Giddiness, turbulent Flatus's and Cramps, Convulsions, Tremors, Ructus's: *Aquositates & Flatus inter binas tunicas seu membranas mesenterii; Ventriculi dolores vehementes adsunt, qui nonnullis ad dorsum usque procedant, & ab agris incanisque pro Nephriticis habeantur; concoctis cibis quiescant, mox aliis ingestis cibis eodem modo revertantur, qui interdum jejunos, interdum etiam à cani molestant; & non cessant priusquam agri evomunt cibos crudos & Phlegmata subamara & calida aut acida; Alvus adstricta; Aestus in Hypochondriis; Urina tenuis; Anxietas Ventriculi; Pulsus varii; Cordis palpitatio; Animi deliquium; Pulsatio in sinistra Hypochondrio ab intemperie calidâ; Palatum lingua & os exsiccantur; & sitis levis excitatur; respiratio difficilis; dolor quidam & confusio in pectore persentitur. Transiit quandoque in Melancholiam & Epilepsiam, aut Apoplexiam abit; quandoque caci evadunt; Symptomata Paralyti & Convulsioni similia; Lassitudo; Cerebrum exsiccant vapores & vigilia adsunt; Insomnia or vain frightful and Distracting Dreams suddenly and often disturbing the Sleep. Night-mare, or sense of oppressing weight; Tension of the Hypochondries, but that is a sign, nor constant, nor peculiar to the Distemper; Obstruction of the Oesophagus or Swallow; Periculum suffocationis conqueruntur; dolor in anteriore parte Pectoris; stupor & dolor Formicans nunc in dextro nunc in sinistro; Caligo; Dolor in Brachio vel digito hoc vel illo; sudor Frigidus,*

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& de graviore morbo sibi metuumt. And at last the part where the Humour lodges has its Symptoms, as Stomach, Spleen, Liver, &c. which are then affected most six or seven hours after eating. Whence these Flatus's proceed, the Sense of Sennertus is, *Magis consentaneum est istos Flatus contineri in illâ cavitate in sinistro Hypochondrio sub Diaphragmate ex Ventriculi, Omenti, Coli & viscerum connexu ortâ, & exitum non habente, sed ita conclusâ ut aquam & Flatus continere possit.* And for the beating in the left Hypochondry, says he, *Ad quam rem faciunt Glandula in Mesenterio plurima & præcipue magna illa, quæ in centro ejus prima vasorum distributioni addita est.* But the more difficult part of this Distemper to understand, is, that it not only affects and distempers the Brain, but likewise the Mind it self is a sufferer in it; which it chiefly or first afflicts with Fear and Despair; and freeing the Passions from the government of Reason, makes way to all the extravagant Actings, that an abused Imagination can give colour to; and every Object receives its weight from the Standard of the ruling Passion. The extravagant Dotages of this kind are numerous in History, and either are ruled by the Impressions of the last Stage, or Age of Life, or drown us in the present; or which is most common, distract between the Sense of both; and make us lose the use of our Judgment, if not of our Reason. Now this Distemper is effectually cured in all its Symptoms,

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Symptoms, by these Light Chalybeat Waters; and to inquire into the Nature of this Distemper, and on what account they do it, may not only be agreeable to enlighten the Disease, but teach us the full Scope of the Virtue of the Remedy. If we seek into the Cause and Seat of this Distemper, we may observe it to be induced by despiriting, and may have its Original either in the Mind, or the Body; and as it naturally is produced in our Bodies, I observe,

1. That it is a Flatus, as gross, crude, unconcocted, and vapid.

2. That the Fit usually comes six hours after eating, or as soon as the Chyle is digested, and the Spirit of it spent.

3. It is occasion'd by Diet, yielding a thick and plentiful Nourishment, and Flatulent, and by thick fermented Liquors as Ale.

4. A working active Life that preserves the Concoction, and duly forceth on the Nourishment, and cleanseth the Body, joyn'd with a spare and more simple Diet, is little affected with this Distemper.

5. Sower Belchings, not Signs of Acid in the Body, as is commonly judg'd erroneously, but only the effect of rich Liquors despirited, and effete or changed.

6. The time of its Accession is remarkable, which is at the Turn of Life to its decline, or at 27 Years, though may be put off longer in some, but begins then, when the Body begins

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to be despirited, when whereas before we see every thing through the eyes of hope, we now are apt to view with despair.

7. It joyns hand with the Scurvy.

8. Is cured by Acids, as Spirit of Vitriol or Sulphur in some measure, and kept off by drinking common Water, which is void of Fermentation, or elastick Turgescence.

All which marks inform us, That this Distemper is seated in the Chyle, which when effete and tumultuating, produceth these effects; and as it may be discharg'd and flung, may induce more terrible ones in earnest, which as it is moving, it only represents by lighter touches: And as the grand Cardo of our Life at the Climacteric before named, gives opportunity for this Insult; so the strength of these Turgid parts of our Nourishment, is discernable in other States of Life, though the Violence is most apparent at the meeting of differing habits. For that all these Irregularities are owing to our Nourishment, and that we admit our Dispositions to Passion and Vice by our Throat, and only then when we take more than is necessary or requir'd by Nature, we are taught not only in Men where we see the effects of Ease and Luxury, only when it is in an high degree; but the power of differing Nourishment and manner of living, is most conspicuous in other Animals, especially the more tender. These Animals that live hard (that is) use great labour to get their Food;

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Food; and that mild and unfermented, are free from three Dispositions that Domestick Animals, as those that dwell near Towns, or have opportunity of living easie, are lyable to. The first is, change of colour in Coator Feathers. 2. Inconstancy to their Mate, and Intemperance in Passions. The last is, Distemperature of Body, and lyableness to Diseases. No wild Animal was ever observ'd by Naturalists, to have been seiz'd by those Diseases which afflict them when kept tame. Hens I have seen Epileptic, Magpies are often afflicted by the same Distemper when housed, but who ever found them fallen in the Fields? The same may be observ'd of other Animals, as Bull-finches, and many Quadrupids, which can scarce bear housing, without peril of some Disease or other. Which seems to imply, that a distemper'd Air can make no impression, but upon a vitiated Nourishment. And this gives me a rise to add, That as the Efforts of our Passions, that are owing to our Intemperance, are more silent in other seasons of our Life, so it is observable, they have not been distinguish'd by any Inquirers into Humane Nature, through want of well understanding Humane Nature distinctly, or in its simplicity. And here I find a late excellent Author much wanting to himself, in not examining the Fountains of Idea's, which would have helped him to have uncompound-ed them, who, might by this means have discern'd

cern'd Practical Idea's; a Principle of Justice being as difficultly erased, as that of Self-preservation. For (to wave questioning the Hypothesis of Idea's) since Judgment is made of Objects, as they lye in the Imagination, it must needs be, that, as on the one hand the undue Examination of things may make a Notion imperfect, so the strain of Imagination by our Passions, must render our Judgment unjust. And this we see in our grosser Passions, as Fear, Anger, Love or Aversion, but cannot discern it so well in the lesser Emotions of our Temper, which seem more quiet, wherein yet it is equally discoverable, that the Inequality of our Temper sways our Judgment, and is often before-hand in the Cause, where it appears only in the sequel, and seems to proceed from the Determination. Indeed we may usually see in any error the stamp of that Temper that form'd the Argument, or of a rapid and unheedy Apprehension, that inform'd the Understanding; so necessary to right thinking and due Notions of things is a due Temper, by how much our Passions have a share in adjusting, if not forming, our Idea's. I might here observe the Mistake of those that refer the illness of their Nature, to the necessity of their make, and how natural the Account is, of Man's first Defection: But to keep close to my Subject, I shall only mind, that the Debility of our Mind, as well as the Infirmities of our Bodies, is owing to the
the

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the Irregularity of our Living, and Vice of our Nourishment. An Instance of this, is the Distemper in hand, not only in the distracting Fears, and tumultuating Passions, that attend it; and the innumerable delirious Fancies that are consequent to it, but in the Diseases of the Body, as Obstructions of the parts before mention'd, with Cephalick Diseases, as Convulsions, Epilepsies, Apoplexies, &c. the last nam'd of which, is so often owing to the Pre-disposition of this Distemper, as much confirms the account I have before given of it. Now although the reason of the Hypochondriac Affection, as it gives a reason of the effect of these Waters, may make this account satisfactory enough; yet it is farther serviceable, in discovering the Cure more clearly and perfectly, and by giving a right Notion of it, may assist in setting the Understanding to rights, and help those that are afflicted, to make a true Judgment of their Disturbances, as well as encourage them to a Cure. With respect to a Cure, we may observe the Benefit of Exercise, and a moderate Diet, without fermented Liquors; and that Action and Attention are required, to Health of Body and Mind. That Action is necessary to due Thinking, all studious Men may and do observe, and the reason is, That the Tumults of the Chyle, or Stoppages of the Vessels by it, are remov'd by the hurry of the Blood; which, together with steadiness of Mind,

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Mind, which I call Attention, gives our Engine its free Exercise and Working. And as the same thing, that Exercise doth with moderate Living, is effected artificially by these Waters, so the pleasure of an even Life, void of these Hurries and Inconveniencies, recommend a preventional Method of this way of Living, for its Rectitude and Generosity, before the Flights and Extreame of the other, that must seek for Remedies to Art. And it is to be noted, That as this Distemper, in all its Symptoms and Consequences, is effectually cured by these Waters; and as it is moderated by the foremention'd means, so all that are affected with it, find their Error in drinking Wine and strong fermented Liquors, as an artificial Support, by the great sinking of their Spirits, if not other Symptoms; likewise about six hours after, and by the increase of the Distemper by that means. To which I may add, what may be no small Information, and hath not been taken notice of by Physicians usually, That the Distempers that seize the Body at the Chimactericks, if they be moderated, so as to be kept from making any mortal breach, will usually in two or three Years time, depart of themselves upon moderate living. I could give many Instances of Epilepsies themselves, as well as Giddinesses, Convulsions, a beginning Phthisis, &c. that abated without any means two or three Years after. But as this Remedy, viz. these Waters,

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ters, relieve variety of Diseases, that are induced by the power of distemper'd Chyle or Nourishment, and Weakness of Constitution at the Cardines of our Life or Climactericks; so the Observation of this may turn to account, if we consider, That many Distempers that are not usually distinguish'd, are of this Original: For the enlarging therefore of this Benefit, we may observe, That the *Affectus Hypochondriaca*, is, in this respect, but a Species of Distempers, which we may call Climacteric or Cardinal. For the better understanding of my Sense in this matter, I must take notice, That though I cannot admit the receiv'd Notion of them fully, either as to their Fatality, or superstitious Original from Numbers, yet that at the Septenaries, or near the Body, receives its Changes, is not to be denied; and that then many Diseases have their Original, which may execute not fully till some Years after. But although every Septenary may be in some sort considerable, yet I judge from Experience, that some may be reputed Cardinal, and that not from the Efficacy of Number, which runs the grand Climacteric upon 63. Those that I find reason to name Cardinal, are those on which our Life receives a considerable Change of State; and though the fourteenth Year, on this account, cannot be excluded, yet Observation of Distempers, or Mortality, makes me, with respect to Diseases, to make or name three
grand

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grand Climactericks, and to fix them on those Years, when the Body receives its grand Alterations in its Cuspis and declension, and these are 21, 27 and 49. The Diseases of the first are Hemorrhages and Consumptions, which are frequent at that Age to enter the Constitution, and not to yield to Remedies till two or three Years after, though the Prevention of Exulceration render it curable. The Distempers of the second are Cephalick, Nervous and Flatulent. Those of the third again are Phthises, Gouts, Stone, Hemorrhages, Rheumatisms, and other Inflammations, that proceed from an over Alkalifat Crasis of the Blood, as hot, burning or smarting running Pains, and the like. In all which cases these Waters may be expected to be highly serviceable, by the same Qualifications that capacitate them to relieve the Hypochondriacal, viz. by Astringing, Deobstructing, Invigorating, and taking off either the Organism or Degeneracy of the Chyle. And I speak not this without some Instances that favour it: But from Hypochondriacal Distempers, I pass on next to Ulceration of the Kidneys, which I have known cured in more than one by *Tunbridge* Waters, which I must make this Remark on, That they were Women of the last cardinal or grand Climacterick. But yet must not this confine the use of these Waters to that case only, or forbid their proper use in like Ulcers in other Ages.

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Thus according to my design, I have recited what I have experienced of their Virtues, but I must not pass the Cure of Periodical annual Colds and Feavers (which I mention above) without this useful Observation, that as it is the Peccancy of the Chyle, or Fæces of it, that makes the Body obnoxious to the Effects of the Air, so it may be reasonable to expect the use of the same Remedy to be successful in some other Distempers that come under this Consideration.

Of some general Directions to be observ'd in the Use of the Chalybeat Waters.

THE Directions that emerge from the Nature of the Waters, and of the Distempers they are used in, vary in some measure with the Constitution of the Drinker, the State and Nature of the Distemper, and Season they are drank in. And although the Choice of the Species of Water is directed by the Distemper, yet nice or infirm and cold Constitutions, make exactness necessary in choosing those that have least Coldness; on which account some have found, in the light sort, *Wellenborow* and *Islington* less safe to be drank, or to require more caution, from their ill Effects on those that have drank them when
out

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out of Temper. The Season that one would wish to drink these Waters in, is a dry Time, and Summer, the Waters being then strongest, and the Season favouring their exerting their Astringency, and inspiriting Qualities; yet as Distempers do not wait always for the conveniency of the Remedy, so the Waters have been found effectual at all Seasons likewise. And the incommode of the Season may be help'd, by a Glass of somewhat more Generous, after the Waters are run off, as *Gentian Wine*, or the like; or Chalybeat Wine in the Afternoon, which I have found to be very Helpful, where the Moisture of the Season, or Weakness of the Constitution made it necessary; but not to be continued longer than it was so. The difference of the Water makes some difference in the rule of Drinking, the Heavy ones not allowing so long a Continuation of Drinking, and often admitting, if not requiring, Purgings, during the Course, which six Weeks may well determine; whereas the light sort may safely, and ought to be continued longer, to prevent return of the Disease, and establish the Constitution: Else the Chalybeat Waters require the same common Rule, which is to be observ'd before, in the time of, and after the drinking. Before the drinking, that the foulness of the first ways may not be carried farther, and at least clog the Remedy, and that Nature may be more light and easie, that must be removed,

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before the drinking of the Waters is entred upon. And although it cannot be supposed, that the proper Purges for particular cases, can here be consulted, yet that Emeticks, in Cephalick Diseases, are best and fittest to answer all the ends necessary, is an Intimation I cannot allow my self to pass. Catharticks ought to be doubled at about two days distance, the first to regard the cleansing the first ways, may be by a Bole of Lenitive Electuary, and as much *Resina Jalopii* as may quicken it to desire, or Pills, or Draughts of Infusion of Sena and Rhubarb; in both which forms, I admire the additions of Salts either of Wormwood or Tartar, that may make them more deterfive, and occur any unnatural or exorbitant Acid. The latter Purgation ought to regard the Disease, as Lenitive Electuary with *P. Diasena*, and *Dialthea*, or Manna for Gravel. In Colicks, and where the Wind afflicts the Bowels, *Hiera Picra*. In Cephalick Distempers, or where there is a Disposition to be Aguish, gentle Emeticks. Where Wind afflicts the more remote Passages, or in the Blood, afflicting the Muscular parts, Infusions of Purging Ingredients, as Sena and Rhubarb, with a handful of Chamomel Flowers, or the Weakness of the Stomach may require the *Decoctum amarum* made Purging, or Pills of *Rudis* and *Ruffis* mix'd, and two or three drops of Oyl of Cinnamon. The Dropsical *Succus Ebuli* in the quantity of Cochl. 2

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vol 3 is most proper for, in my Judgment: In the Melancholick Constitutions, an Infusion of Sena and Salt of Tartar, among others, is one of the first rate: The Scurvy, bitter Decoctions. The three last Diseases, these Waters, as other Chalybeats, serve, by strengthening, invigorating, and carrying off the offending Matter; and therefore those need a due preparatory Course, as is sufficient to bring the Blood and Vessels into such a state as may be fit for these Waters. But yet beginning Dropsies, and other Obstructions from Trouble of Mind, admit these Waters as the only Remedy, and require no course but this general Preparation. Excepting Dropsies, and Distempers that are attended with old Obstructions, and Apoplectick Dispositions in Phlegmatick Brains, I say, setting aside these, the Purging Waters are the best Preparative, washing more universally, and leaving the Body in the Temper that is most fit; and sometimes prevents the necessity of these Chalybeat Waters; the Proprieties of which, will appear in a Table at the end of their History. But because Pains of the Stomach often happen to be so violent, as not to allow the use of these Waters before they are abated, and sometimes require a particular Evacuation, it seems incumbent on me, to give some information, how that Symptom may be reliev'd: They are usually one of these three sorts, First, a Convulsive Nipping Pain at the pit of the

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Stomach,

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Stomach, that holds for some Weeks, and soon upon eating is exacerbated: This usually readily gives way, either to an Infusion of *Bacca Juniperi* in Whitewine, or *Ol. Terebinth* taken inwardly, the last 16 drops at a time in Beer. Another is a Pain all over the Stomach, though sometimes gathering more to one part of it, and is more violent and racking, and goes off with a Looseness, being from a Congestion of Watry Matter; This yields to the common Domestick Glysters often repeated, and is check'd by *Ens Veneris*, and sometimes by Chalybeat Wine. The Pain that attends a *Chlorosis* by *Ol. Caryophyllorum* taken in Sugar; if from a depauperate Blood, by *Vinum Chalybeatum*.

Phlebotomy here comes under consideration, which, although some Asthma's, and other cases, may render it necessary, yet, where not necessary, is to be avoided, as an ill Preparative for drinking of Water; and must be referr'd, together with other Preparations in particular Distempers, to the Judgment of the Physician that knows the Distemper, and consults the Constitution.

Of drinking I purpose not to prescribe either time or quantity, which vary with the Disease and Constitution of the Drinker; but only shall note, that as rising gradually to a full quantity, is required not only by the body, that it may the better bear it, but by the distemper'd part too: So the Vessels, that they may

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may be cleansed and strengthened in their own Tone and Tension, require a gradual decrease. But though the continuation of this Remedy must be prescrib'd by the Nature of the Disease, yet that a Caution is necessary, that the drinking them be not left off too soon, appears in that in my own Observation, many having suffer'd a Relapse, for want of continuing the Remedy some time after the Cure. And this is so general, that I may peremptorily assert, that less than three Months is not generally sufficient to the drinking of them, though they take effect in half the time. It is not convenient to drink these Waters too early, nor without some preceding walking to empty the Body; neither is it safe to lye down upon them, especially in Cephalick Disorders; nor to allow any business to take place in the Thoughts; on which score the distance of the Wells, and the Resort, recommends the drinking these Waters at their Springs. But the most material Rule, which the very design of them require, is, That during the Course, the Drinker use Exercise, avoid all Flatulent Diet, and that of Gross and much Nourishment, and drink as little fermented Liquor as he may. And here especially drinking much Wine is to be condemned on a double account, for beside that the inconvenient Temper that the Wine gives, renders them unfit for drinking the Waters the Morning following, it opposes the Remedy,

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and renders it ineffectual, by supporting the Morbid State; and for this Reason, as generous Liquors are not to be omitted at the beginning of the drinking, so they ought wholly to be set aside when the Course is well enter'd; without which, Hypochondriacism, which is the most general Case, will not admit of any entire Conquest. Neither is the Course of Living to be ended with the Course of drinking the Waters, but that the use of them may be effectual; a spare Diet, and the same abstemious living, with Exercise, ought to be continued for two Months, in which time the Body may be suppos'd to be a little confirm'd. And for the same Reason, though some Distempers, as Stone, Jaundies, and Melancholy, particularly, may require some other Intentions to be satisfied, and so make a Course of Physick necessary at the same time, yet the use of the Waters is so much the less beneficial, by how much it is disturb'd by Purgings, or any other Medicines, and therefore Reason and Experience place this means last. But in Apoplexies, and some watry Distempers, as *Dropsie* and *Chlora*, an Astringent more potent is very necessary to close and strengthen the Parts. The most proper and powerful of this kind, I intimated above, to be the *Elixir* of Mr. Boyle, which, if it succeed, the Waters, as the other Detrimental and Purgent are to precede, make an entire Course in the surprizing Distemper that I there apply it to;
and

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and in the room of it, I have sometimes used Chalyb. Preparat. with equal Success, if the Apoplectick Symptoms were mild.

These Waters, as they suffer by warming, so are apt to bring some Disorders, especially in an ill Season or Constitution, as Cold, Nauseousness, difficulty of Urine and Giddiness, which are usually provided against by drinking a Glass of Wine after every three or four Glasses of Water, for the first few Mornings. But because the two last Symptoms do sometimes prove more considerably obstinate, I shall take notice, that it is good for those that are obnoxious to Cephalick Diseases, to provide against the Giddiness procur'd by these Waters, by chewing of Nutmeg, and indeed Bisket, or a Crust of Bread chew'd do the same, the motion of the Jaws seeming as necessary as the warming the Stomach. And for the Stoppage of Urine, shall acquaint the Drinker, that where it is not occasion'd by the Stone, though Glysters and Purgers may be requir'd sometimes, yet it may soon be remov'd without usually, only *℞ Terbinth. guttis iij. in umbilicum insillari*: And the same I have known done by a plentiful Glass of Rhenish. But in all these Rules, I must make this reserve for the Heavy Chalybeat Waters, That Purgings is absolutely necessary during the taking of those, which are not so clean, nor pass so well, and may bind the Body too much.

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I have nothing more to add, but for a Con-
servative of Health, to recommend the drink-
ing of *Tunbridge Waters* with Wine in Win-
ter, to the Hypochondriacal, which are easier
to be had than the *German Spaw*, and are as
much better than those, by how much they
are lighter, and which, in Flasks headed with
Oyl, will keep well.

T H E

THE
Natural History
OF THE
Purging Waters
OF
ENGLAND.
With their Uses.

PART II.

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P A R T II.

THE Purging Waters of *England*, for their Pleasantness, easiness of Working; and extraordinary Effects in many Distempers have been justly celebrated; but as their Original hath not been yet prov'd, but

but remains a Question among Learned Men; so the Varieties of their Natures, not having been examin'd, have rendred the differences of them unuseful. The due Examination of both, I shall therefore propose, with their Uses, which we shall find great, and very distinct. The Method I shall use, shall be to set apart their Principles, and then inquire into them, and then make Essays of the Waters. In order to this, I shall distinguish their Characteristicks and proper Signs, and trace their Original. And that we may proceed surely, I have examin'd the Waters at the Wells, and the Earths of the several Wells, my self, except those that I had as sure a Conveniency of inquiring into, by some accurate and unquestion'd Friends. The Purging Quality of these Waters then, resides in the Salt, which is peculiar to Wells that have these Qualifications.

These Purging Waters are all found above the dead Loam, in a Loamy Clay, that is the same continued to the Foundation, or dead Loam. This I have found common to the Selenitical Waters, as well as others; and in this Loamy Clay, the Water hath only a level Spring: And though the Waters, by the Surface, may seem to be in a Gravel, as those of *Richmond*, yet the Earth, as I was there inform'd by those that sunk the Well, proves to be a continu'd Clay, and without mixture of Gravel down to the dead Loam. The *Scar-*
borow

borow Waters, by an Exception against this, being a running Spring, and in a Gravel, but the Earth of all others, that have had a gravelly Surface, proving upon Inquiry a Loamy Clay, as that of *Richmond*, and that near *Colchester*, it is reasonable to allow me it here, where the Spring is not lyable to enquiry; and since in my examination of that Spring, I shall prove it a complicated one, of a Saline Water, as the rest, joynd with a Chalybeat Water, which sort are ever running Springs.

2. A Nitre ever appears on the Earth, about the Springs where it is expos'd to the Air, so at *Scarborow*, *Woodham-Ferrys*, *Alton*, &c. at *Epsam* it shews it self like a white Incrustation; yet these Nitre all differ from the Salts contain'd in the Waters.

3. The Matter impowering these Waters, is a Salt, of which they contain a great quantity, some in a dry Season, affording near a Dram in a Pint: The Quantities may be collected from the weights of the Waters; and this Salt not Volatile.

4. They have universally one common Index, that is, a Stone, form'd out of, and bearing the face of Loam within when broken. At *Epsam* it is more mellow, from the quantity of Chalk that that Soyle affords; else it is naturally hard, as I observ'd it in all the other Wells, almost to striking of Fire with Steel. At *Alford* (my Friend inform'd me) the Stone would strike Fire, but not strong enough

enough to kindle Tinder: This Stone is is a sort of *Pyrites*, as the great Naturalist, and Learned Physician, Dr. *Martin Lister*, rightly names it; but that being a name of a Genus of *Marcasites*, and so too large an Appellative, I shall particularly describe this, which is peculiar to this sort of Mineral Waters. This Stone then (which is found in these Wells, at the bottom near the dead Loam where the Water oozeth) in outward crust resembles a Pibble, and as unform'd, and as differing in bulk, most amounting to the size of a Man's Head; and more of them are found bigger than less. It is heavy and very hard; when broke, it appears coated, with flakes of *Gypsum*, some white, some yellowish, some *Alabastrine*, not exceeding in thickness the eighth of an Inch; and from its breaking, and thready Composition, is distinguish'd by Naturalists by the name of *Trichitis*. This Coat invests some wholly, some are cas'd here and there only, some this passing into, divides into parcels: The Matter or Body of these parcels too, differ in hardness, and some in colour, containing Iron, either of the natural colour as in most, or rusty, as in *Richmond*; but most of these Stones are pure Loam hardened. *Richmond* Stone had this peculiar to it, that the Stone was invested with *Gypsum*, but not divided by it as the rest, and was of a lighter colour, near that of ashes not high burnt.

The Stone of *Dulwich* again resembled the rest, but had many shining Particles appearing, as in Marcasites: Their differences and different Reasons follow by and by in their Essays, and will be found agreeable to the account of the Waters; where they will be found to have no Essential difference, from any Metalline parts or other, besides what the differing nature of their Salts import, which from their differing depth, and remoteness from Nitre, makes the Stone proportionably Marcasitical, or vary with the Soile: The shining of some of these Stones, I refer'd to the Marcasitical Nature of the Juyce, and found the same Particles natural to the dead Loam, whence this Juyce seems to be deriv'd, which seem'd to imply, that the difference of this Juyce, consisted not in any accession of Mineral parts, but difference of Digestion, and the Qualities the different Region may give it. I observ'd, among my other Essays of these Stones, that when by Fusion with fine Glass, I endeavour'd to discover any Mineral Tincture, though I discover'd not any, yet the *Dulwich* Stone in the same Fire, and at the same time, pierc'd the Vessel it was melted in, which was of Tobacco-pipe Clay, and made it break smooth and shining like *China* Earth, which the other Stones did not effect.

The Gellying of these Stones in *Aqua fortis*, to me imported the same, it being the nature
of

of differing Marcalites, to form a Butter with the same Salts; from which yet these differ'd, in that these afforded it not by Sublimation, which I try'd. And from the Nature of this Juyce, the *Dulwich* Water seems to derive the unkindliness of its Effects, which bears not drinking with the same freedom as others, being more cold and heavy on the Stomach. The further inquiry into the Nature of these Stones and Juyce informing them, and how they have reference to these Waters, comes in its place. The harmlessness of this Juyce, appears in the *Epsam* Stone, which is more lax and open, being not harder than a Chalk, which shew'd its Original, but not the Essence of its Purging, to require the unalter'd Juyce: That the *Epsam* Stone is the same with the other appear'd, in that some parts of it, as well as some parts of the Gypseous Earth, would gelly in *Aqua fortis* as well as the other; especially those parts where the Selenites shot. Else the Infusion of this Stone gave a Green, with Syrup of Violets, which the others gave not.

Having thus found the constant Mineral Qualifications of these Wells, and *Indicia* of the Waters, it will be satisfactory now, to observe more closely the Waters, and in what or how they agree. And these prove to be the same in Original and Nature further,

1. That

1. That the Taste is common to the Waters, as well the Selenitical, or wherein the *Selenites* are form'd, as the other sort which are found in a constant loamy Clay and even, and this in all its differences. For the smooth Taste of *Richmond Waters*, is match'd by the *Colchester*; the Bitterness of *Epsam*, in *Dullwich*, and a little in *Brentwood-weal*. Besides there is somewhat of a common Taste to all; so that may assist us in discovering their Principles.

2. The Salt, though it differs, some being figur'd, and some not, (of the latter sort being *Epsam* and *Alton*) some melting difficultly, some easily, with the heat of a temperate Hand, as the Salt of the same Waters do; yet it agrees in its Nature, between a Nitre and a Vitriol, joyning with Vitriols, and not precipitating them, freedom from any Corrosive Qualities and Temper, in which is a Union of Acidity and Nitre; and working a little both with Acids and Alkalis, and having these Qualities, the same with the Salts, they are affine to.

3. In their Virtues, not only in the Faculty of Purging, but in helping the Appetite, allaying Hypochondriack Flatus, and the like Effects which are Vitrioline.

Now the Purging Wells are of two sorts, The first affording a Stone, call'd by Naturalists the *Selenites*, which is shot in the Clay where the Water issues; and these Wells al-

ways afford veins of putrid Iron, together with the *Selenites*, and some quantities of pleasant Acid Juyce, like Spirit of Sulphur or Vitriol, in a condens'd coagulated form, or mix'd with the Earth, and lying in yellow or Ferrugineous Veins. Thus both at *Epsam* and *Woodham-Ferrys* I found it, by examining the Wells when new dug. The other sort have no differing face consisting of an uniform Loam to the bottom.

I shall first give a short view of the proofs, by which we may be sure we are rightly fix'd upon the true Ingredients or Principles, and then examine their Nature, and Reason of their Production.

That the Matter which these Wells exhibit to our view, are the very Principles of the Purging Salt of these Waters, and parcels of the Matter, is proved by these following Particulars.

1. The Nature of the Purging Salts varies as these vary, as may be observed by the comparing the Effays of the Waters, with the Tryals of the Stones, and by softness of the Salt of the Selenitical.

2. The same Ingredients and Matter found in all, and account for what they differ in, and from the preceding Uniformity.

3. It is not of a deeper Original, because where-ever these Ingredients are found, there is likewise the Purging Water; but beyond these marks, is never any thing found but a
dead

dead Loam, unpassable to Water, and unopen to yield Salt: And this is clear in the Selenitical Water at *Epsom*, where neither Water nor Selenites are found lower, though attempted some feet lower to enlarge the Spring, which proved only common dead Loam.

4. Not of a wider Derivation, none of the same Waters lying in the neighbouring Earth, whence these Springs may be suspected to descend; nor any of the Indexes of them, nor any Metals or Mineral bodies. Nor indeed are these Earths found lying over any Mines, constant at least, as these Signs are.

5. Another most evident sign, that the Principles are here rightly fix'd, is, That the Species of these Waters which afford the Selenites, we have a clear and good account of from all Naturalists, to proceed only from a mixture of Loam and Chalk-stone, and perhaps a little Iron; and never to be found over any Mine, but over Quarries of Chalk or Stone. Which is a sufficient Argument, and the more considerable, in that they never took notice of the Purging Qualities of the Waters.

6. The Signs and Qualifications of these Wells before recited, are proper to them only.

7. Another Argument is to be drawn, from the Disposition of this Earth to produce a Salt, as is seen in its Efflorescence.

8. From the softness of the Salt of the Selenitical Waters, which will be understood and compar'd in the following account.

9. Their Innocence, regular Variation, and that these Principles account for all their Phenomena, prove the Salt of these Waters to be the genuine and natural Product of these Principles.

To all which add, That the Purging and Medicinal Qualities resides in the Salt; and that the open nature of Clays, would discover any Mineral or Metal concern'd, and not conceal more than we may observe.

That we may understand whence, or to what is this Salt owing, the Original of the Salt, and nature both of the Earth and Juices concern'd in the Production of it, I proceed now to examine the Principles.

The Principles or Ingredients that impregnate the Purging Waters, examin'd.

HAVING thus traced the Production of this Salt, and determin'd it to the Earth, through which the Wells are sunk, and Mineral Stone or Juice contain'd in these Stones; we come now to examine these, their Nature, and what parts of these enter the Composition, or how they are concern'd in the Production of this Salt. And upon due Essays of these Earths and Stones, we shall find in general an Earth rich of Salt, Chalybeat or Ferreous parts,

parts, a Mineral Joyce out of which this Salt seems form'd; and we may observe the Salt of the upper Soile somewhat concern'd in, and that on the Varieties of the two last, the Varieties of the Waters do depend. And these I shall enquire into, as to their Original and Nature.

The Earth in which these Wells are, and which yields this Salt, is a Loamy Clay, more mellow, and more of a Clay toward the Surface, but more loamy toward the bottom. The inner Earth is such as our Tiles are made of; at *Richmond* at *Epsam*, they dig both Brick and Tyle, Earth too, as I remember, out of the Hill yielding these Springs. So I need not describe the Earth, it being known that the ponderous close and fat is used for Tiles, and the looser for Bricks. The colour of these Earths vary a little, and though usually Brown, yet in some that colour is brightned near a Gray. The Earth of these Springs is found of these two kinds constantly, either a meer Clay of the same face to the bottom, as are the Wells where the Salt is Christalliz'd, or firm and figur'd, or the same Clay mix'd with Veins of Iron, and pleasantly Acid Joyce, like Spirit of Vitriol, and interspersed with Selenites, which are form'd in it. The Wells where they dig, only a pure loamy Clay, ever toward the bottom (which is seldom more than twelve Feet, and I think never more than twenty in depth) receives the

Water from the sides issuing from between the Stones before describ'd ; and nothing besides is observable in these Wells.

Now not only the face and figure of the Salt, but its Nature likewise, acknowledge this Earth as its natural Parent, and all is confirm'd in the manner of its Production. The form of the Salt of the Wells, usually resembles the Salt shot about them upon the Surface of the Earth, which at some is in Stirie, at some appears only like a soft mould. The Nature of it is middle between a Nitre and a Vitriol, which agrees well with the Earth it is form'd of, Nitrous Earths requiring slackning in the open Air. And the manner of the Production of this Salt, is fully as agreeable to this account, for it is not only at these Wells, that this sort of Earth shoots this Nitrous Efflorescence, but at all other places it is observable, as frequently in Ditches, and where-ever it is cast up by the Tile-makers ; and which is worth a Remark, as discovering the Reason or Manner of its Production, it is to be noted, That this Efflorescence, appears only where the Air is moist or damp, and confin'd. This I observe, not only to account for the Production of this Salt in Subterraneous Channels, but also for the difference of the Salt of the Water, from that shooting on the Surface, that the Salt of the Water is more Fusil, and retains more of the Acid part of the Salt, which
is

is collected in proportion to the Closeness, and the Moistness or Coldness of the place. And as a further Illustration and proof of what I assert, I shall give the Reader one or two Essays of Loam taken from common Pits for the making of Tiles, which prove that this Earth contains a Salt that may be extracted, and hint the manner of its Extraction. For although no Loam yields any Salt to an Infusion of boiling Water, yet I found that Water sharpened with Oyl of Vitriol, or common Salt, or Spirit of Salt, would extract a Salt; and which is yet more, that Lime water would slacken it, and make it yield one. I shall give the Examen of Loam, opened by Spirit of Nitre, and Spirit of Vitriol.

Loam Water made by Infusion of common Water, sharpened with Spirit of Nitre, gave with Tincture of Logwood, a pale dusky Tawny. Gall, a faint blewish Black, not thick Syrup of Cloves, a dusky Red and palish. Sal Absynthii, a white curdle, which easily dissolved in washing, and left little Earth. Syrup of Violets, a bright Red.

It differ'd little in taste, from what the Spirit of Nitre gave.

Loam Water two Pounds, with Spirit of Vitriol two Drams, infused a Week, had the rankish taste of the Purging Waters.

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With Tincture of Logwood, a sooty dusky colour, a
little reddish.

Syrup of Cloves, a red not bright.

Sal Absynthii, a white Curdle, not easily soluble.

Syr. of Violets, a purplish Red.

Sublimate Water, no alteration.

Loam Water made with common Salt.

With Tincture of Logwood, a bright Red.

The Salts of these Infusions were collected
by evaporating.

I shall note, that these Infusions will detect
some Ferrugineous parts in Loam, and which
seem separated in the Selenitical Earth, rather
than added. The Salt that these Loamy Clays
yield, as it is of a common Origine with that
of common Earth, or upper Soile, so it seems
to vary much on that account with the neigh-
bouring Earth; but that this should be so
very rich in generating, it must be from the
more Saline Nature of this Earth, or from
plenty of some Menstruum to extract it; the
first may be from the continuation of this
Earth with the grand Matrix, which in others
is intercepted by Lays of Gravel, or the like:
The latter may be from Jnyce, which is in a
sort Vitrioline: And the closeness of this
Clay, does much contribute to this Collection,
as well as the coldness of it. But the Nature
of

of this Juyce comes next to be examin'd, under the Essay of the Stones, which are Parcels of this Loamy Earth.

The Stones then, which are the proper Index of these Wells, and which, from their Nature, are apt to receive Mineral or Metalline parts, must be supposed to contain part of the Ingredients at least of this Salt. The Stones I prov'd severally from the several Wells, whence I took them my self, the Hydrostatical weight of which, with some other Essays, I shall more conveniently place at the end of this Account. I proved them by Ustion or Roasting, by Calcination, by Sublimation, by Precipitations: By Ustion, to separate the Salt: By the second, to open the Body, and discover Mineral or Marcasite: The third, to discover any sulphurous Body or Steam. Lastly, By Precipitations, both out of a *Lixivium*, and of the wash'd Stone out of *Aqua fortis*: By all which, as well as by Fusion with fine Glass, the Stones prov'd void of any Metalline or Mineral Mixture. But instead of these, their particular Nature appear'd, to consist in the Juyce or Salt of them, saving only a little Iron which *Woodbam-Ferrys* afforded, and which will be found to agree well with the Constitution of those Waters which are Chalybeat. This particular sort of Juyce, or Salt, appear'd in their forming a Jelly with *Aqua fortis*, which would not become liquid under some days standing; and the

the parts I prov'd to be in some of the Earth at *Epsam*, that lay among the Selenites, though the Stones by the mixture of Chalk did not. This Quality not attending Loam, suggested somewhat different from that to be concern'd in it; and knowing that Antimony, *Auripigmentum*, and perhaps some other Marcasites, with the mixture of some Salts whence *Aqua fortis* is made, would yield a Butter by Distillation; I essay'd this Jelly by Sublimation in like Vessels, but fail'd of my Expectation, and then consider'd that this Jelly, not only differ'd in being produc'd without Heat or Sublimation, but had not the least Caustick Qualities of the other Marcasitick Butters, but rather mortify'd the Acid Spirit. But all these Suggestions and Doubts were clear'd to me, by examining the Origin of this Stone, when I understood it to be form'd of a Loamy Clay, in conjunction of a Vitriolick Juyce. For this I was first taught at *Harwich*, where I found the same Stones exactly, nothing differing, either in face when broke, or whole and invested with the same *Gypsum* or *Trichitis*, and with the same mixture of Iron. These Stones there lye plentifully on the shore, and stuck in the Bank at the bottom of the Cliff, and only at the Foot of that Spot of the Cliff that is a continued Loam. This Production I refer'd to a Vitrioline Juyce in Conjunction with the Loam, because the common Coporas Stones are plentifully found on that shore,

shore, and I observ'd Children employ'd there to collect them; but whereas they lye thick where the Cliff is gravelly, where the Cliff was Loamy, and the shore floor'd with these Stones, I found no Coporas Stones, nor did the Children seek there for them, though they pick'd close by it, where the Bank begins gravelly. So that these Stones seem produc'd in the Loam, as the other in the Gravel by the same Juyce. And since I have understood of several of our Diggers for Tile-Earth, that the Coporas Stone is only found in those Clays that have a Gravel mix'd with them. So that at *Harwich* this Bed of Stones was the Foundation of the Loamy Cliff, where the Cliff has been wash'd away or cut: For the Harbour or Channel there, is Artificial, and of no old Date, the Current having been formerly on the other side of *Langward Fort*, which then stood in *Essex*. The not understanding this, made the Gentleman in *Camden* to mention them as Petrifications made by the Sea. And from this undoubtedly proceeds that Bed of Shells that covers the Cliff at perhaps fifty feet high, which must be carried thither at the making of the Harbour, or clearing of it, how else could the petrify'd Clay bed, which contains the Shells, lye a top, and no Petrification lower, till you come again to the bottom? I think that they must originally have been the same lay, and that it is inconsistent to suppose otherwise.

Having

Having thus arriv'd at the Origin of the Stones, I shall make one farther Observation, which is, That these Stones yield the same Salt in a *Lixivium*, which the Waters contain: From all which I conclude, them Parcels of the Materials, whence these Purging Waters have their Salt, and wherein the particular Nature and Genius of the concrete Juyce is to be had.

All this is confirm'd by the Nature of the Salt of these Waters, which being a mean Salt, between Vitriol and Nitre, requires such an Earth, and such a Place for its Production, for lower it had provid Vitrioline, and superficial Nitrons, which, with the difference of the Salt keeping pace with the varying of the Stone, and with the corresponding Nature of the Salt, produced in moist Cavities, as in Cellars, to that sort of it which is soft, as pre'ently appears, confirms fully this Account, as agreeable both to Reason and Experience.

Of the Purging Waters wherein the Selenites is found.

THis sort of Waters have the same Taste with the other, and the like Variety in the Tasts of the several Waters, and Purge alike. What they agree in is deliver'd above,
I shall

I shall therefore now consider their differences, and the difference of the Principles, and compare the Reason of these, with the Nature of the others. These Wells, upon inquiry, afford no fresh Principles, or Mineral Ingredients, but what the addition of a Calcarious Salt produces, which rather affects these Waters as a Menstruum. I proceed to observe the difference and account for it.

These are ever in a Loam, but this Loam partakes of a Lime-stone, this is evident from all accounts of the Selenites; and at *Epsam* the blew Loam lyes in streaks in the Hill, and a Quarry of Chalk limits the Town at both ends. To this is owing the laxness of the Loam here above the rest, and some differences it shews upon tryals, as its clearness of Iron, which Salt of Chalk and Lime precipitat. and where the Chalk is not found, as at *Woodham-Ferrys*, the Water there is Chalybeate.

The *Pyrites*, or hard Stone, is to be found here, but why it is perfect at *Woodham-Ferrys*, and more lax at *Epsam*, is owing to the same reason. For those two Wells were, what I could examine, being new dug, when I visited them, to view and examine the Earth cast out.

The Differences of the Earth of these Waters, from the other kind, were common to both these Wells. At *Epsam*, the Earth cast out of the Well (I mean *Simpson's*) near the
Parcell

Parcels of Selenites, had some tenderer or more brittle Earth of several colours, but all near a Lemmon colour, or of Iron rust. All these upon examination, both with burning, and without, by bare washing, afforded Iron which obey'd the Loadstone, and a Salt, or rather Juyce, that was pleasingly Acid, and not Caustick, but the Taste differ'd a little, as the Colour differ'd: The Lemmon-colour'd was exactly of the taste of Spirit of Vitriol, without any odd taste; only note, that this I first burnt; and the same Acidity I discover'd in some white Flakes of the Stone, without any Metalline taste. I shall not be particular in the Sublimation of these Mineral Earths, inasmuch as all the ways I attempted to try them, discover'd nothing but pure Earth besides.

At *Woodham-Ferrys*, I observ'd the same colour'd Earths exactly, and discover'd only Iron, and the Juyce or Salt mix'd with it; and as at *Epsam*, so here, the Earth clear'd of these, was loose and open, and was but common Earth, as appear'd by weighing it Hydrostatically. The Particulars, see in the Account of the *Wells*.

Hence I was apt to think, from the Nature of the Juyce approaching to that of Spirit of Vitriol, and upon the slackness of the Earth of these Wells, that the Disposition towards an Alkaly of the admix'd Earth, had detected and separated these Juyces, which seem lock'd

up

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up in the Loam of the other: But the Purity of the Vitrioline Juice in these, make me suspend that opinion; and, as I intimated before, hence *Epsam* Water remains clear with a mixture of Galls, whereas the other gives a dark Purple. I shall, for clearness sake, inquire now into the Origine of the Selenites, and determine the Species of them these Waters belong to, which are a Species of the Purging Kind. For the Salt of these Waters differ from that of the other, as well as the Ingredients, in that the Salt here is unfigur'd, soft, and melts in the warmth of a hand: In their Operation they are accordingly more penetrating, and gall the parts of their Excretion, or near it; which, that it is owing to the softness of the Salt, and Calcarious Nature of it, appears, in that *Woodham-Ferrys* does it not so as *Epsam* and *Alton*. The different Virtues shall be taken notice of in their place, as the differences of the Salt shall be in the Examen of the Waters.

Now I observe, all Waters that afford the Selenites (at least of this Kind and Figure) to be Purging; and because the Wells that afford them, are capable to be proved beyond dispute, as at *Kettering*, and in *Oxfordshire*, it will much conduce to the clear proof of the Ingredients and Principles of these Waters, to give a good account of these which are a member of them.

At the places now named, the Selenites are found in a blew Loam over a Stone Quarry, as I am inform'd by those that have brought me the Account from *Kettering*; and of *Oxfordshire* by *Dr. Plot*: The Circumstances of which (considering the Salt is not volatile) do evince, That the Ingredients of these Waters do not lye lower, since these Stones are so usually found to have the same Foundation, and constantly the same Matrix; for these Selenites never being found the Index of any Metal or Mineral, nor hard enough to be a Spar; but being observ'd to agree universally in constant Materials, which are the same with the other sort of my Waters that is a Loam: And the Mixture of a Lime-stone accounting for the Production of the Selenites, I conclude my account genuine, and clear of them all.

The Selenites of these Wells is form'd near the bottom in the Loam, at the Water, as they ever are, and the Spring small; some are found of all sizes, from the largest to so small, as scarce allow their Figure to be observ'd; and the Loam I found figur'd like the Stones, and lying in clusters in like manner. The Figures of them I found much differing, Those at *Alton* Rhomboid: At *Epsam* many Rhomboid, many imperfect ones, or like Frustula of them, but most of them Columns of six sides only, each side was a Parallelogram inequilateral with a Pointing (which is comprehended under as many Triangles) and their

their Commiffure or Origine unequal ; some of them were more Conical ; but moſtly their Poſition was, as that of thoſe found by Dr. Plot at *Cornwell* and *Hanwell*, many being fix'd like Radii to one center.

Thus I found them at *Simpſon's Well* at *Eſſam*, with this Note, That where-ever they ſtood thus, the Earth adjoining to it had much Iron in it, Fuſil, and pleaſantly Acid moſtly.

At *Woodham-Ferry*s ſome few were Rhomboid, but moſt of them at one of the Lozenge Figure, and reſembling the Rhomboid, at the other round and flat, and ſharp ; the two larger oppoſite Surface declining, till they meet at an edge, which was Semicircular.

The *Selenites* found at *Colcheſter* were thin and flat, and bent a little, conſiſted of *Schiza* or Flakes, and are of no diſtinguiſhable ſhape. I obſerve, that where I could get a view of any quantity of the Earth, caſt out of any of theſe Wells, there were ſome of them always Rhomboid, as the more genuine Figure ; but others to differ, with the Salt, as I judged, and ſometimes to be ruled by the quantity of Iron, and receive the Figure that Metal uſually chriſtallizes into.

What the *Selenites* owes its origine to, I refer my ſelf to the Senſe and Obſervations of Naturaliſts ; who were not unacquainted with this Qualification of the Water in which they are generated. That moſt accurate Learned

and curious Naturalist Dr. Plot, in his *Natural History of Oxfordshire*, Cap. 5. Par. 9. Speaking of the *Selenites*. "*Georgius Agricola* differs from them all, and makes it a product of Lime-stone and Water. *Gignitur* (says he) *Ex saxo calcis cum paucâ aquâ permixto*. And thus I find it to grow here with us at *Haddington*, in a blew Clay that lyes over the Quarry, whose outermost Crust is a hard Lime-stone. For clearness sake, this Stone may be distinguish'd into these four sorts.

1. Those *Selenites* that are really Fissil, into tough flexil Plates, which is more properly the *Glacies Maria*, or *Lapis Specularis*. *Muscovy Glass*.

2. Those that consist of brittle Plates, or Flakes, which are not easily separable, at least entire; an unform'd sort of these are found in flat Plates not very thick near *Colchester* at the North end, at a Publick-house half a Mile from the Town, and in some Wells in the Town. The formed ones usually consist of six sides, the breadth being more than the thickness, make the two level Surfaces broader than the rest. In this they generally agree, but the Rhomboid have their ends form'd in like manner to make that Figure, so as to have ends and sides alike; whereas those that are longer and narrower, vary in the Figures that the Depressions at the ends make. Some are imperfect Rhomboid in one half, and of an irregular Figure, the other half as at

Epjam,

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Epsam, &c. or thinning to an edge, as at *Woodham-Ferry*s. All these agree in an uniform glassy Surface.

3. Rhomboid and in the Flakes, of which it is compos'd, resembling the other; but the Superficies is divisible into strings, the marks or lines of which, appear in the Surface. Perhaps these may be formed only where they are produced at a Stone-Quarry; for of this kind is that at *Heddington* in *Oxfordshire*, and that of *Kettering* in *Northamptonshire*, and so may be distinguish'd in its name as a Species of *Talc*, *Selenites Talcens*.

A 4th sort have a *Cubico-Rhomboideal* form; these are constantly *Hexaedra*, of equal oblique-angular sides, or oblique-angled *Parallelepipeds*; are Fossil into thick Plates, or indeed consist of Cubick pieces of the same Figure; such as at *Slindon* in *Staffordshire*, mention'd by the same great Author, *Natur. Hist. of Staff.* Cap. 3. Part 2. dug in Marle pits. These are less transparent, and as a Species of *Gypsum*, may be called *Selenites Gypseus*.

To the second sort (which I take only to be the proper *Selenites*) belong those of these Purging Wells. This distinction I think necessary to be observed; for though I am inclinable to believe, that the Waters wherein the others are found may Purge, yet the *Selenites*, as they are related to another sort of Stone; and have some variety in the Matrix, may vary (reasonably enough) in their Qua-

lities, as the *Talcum* being produced at a Stone-Quarry, the Waters can scarce be supposed to want the Coldness or Hardness such Quarries are wont to communicate. And so of the rest.

The Origine of the Salt of these Waters, appears most evidently in the Salt of this Species, or sort of them, which I shall therefore inquire into, by examining the Reason of their Production, and compare with the Salt that is nearest in resemblance. The Salt contain'd in the Waters which I call Selenitical, hath these Qualities or Properties peculiar to them, To be soft, and melt in the warmth of a Hand; to be unfigur'd, and fret the parts of Excretion; besides the middle Nature of it, and its being void of Corrosiveness, which are common to the other sort. In its Softness and Fluxiliness, Nature and Manner of Production, it exactly resembles the Salt, that damp Cellars produce, and is fix'd in the middle to Cobwebs, being the steam of the Earth, and more liquid part of what is extracted from it, and flows in the moist Air there condens'd: And no known Salt in Nature hath the Quality of running in so easie a Heat, beside the Selenitical, but that. And as this confirms its Original, so the Reason it further complies with this Account: For this soft Salt in these Wells, is the flowing part of the Matter produced in them, the more solid Particles, and figurable, being detain'd at
the

the Loam, and employ'd in forming the *Selenites*

Now that the Lime-stone which is concern'd in this Production, naturally effects this separation by shooting the more dense parts, is evident in the use of it to precipitate Metalline parts, but more plainly in boiling Sugars. The slackning quality of this chalky or limy Salt, I hinted before to agree with the Earth of these Wells; and it is to be noted, That the Salt of the Selenitical, is accordingly more uniform, not so thickning with Gall, nor varying so much towards Nitre and Vitriols as the others do, but nearer the Spirit. So I conclude the Salt of these Purging Waters, of a middle Nature between Nitre and Vitriols, and form'd out of the Loam, by the help of a Vitrioline Juice or liquid Salt, and collected in moist Cavities.

The Tryal of the Stones.

THE Stone which I have before describ'd, and is common to all the Wells, hath, when broke, the Loam hardned, and is invested with a *Gypsum*, or *Trichitis*.

Richmond Stone is of a light colour and pale, near an Ash-colour, not divided by the *Gypsum*, but coated with it, some Ferrugineous stains were in one piece: In the Air weigh'd

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two Ounces and 50 Grains; on the Water, one Ounce, two Drams and 26 Grains.

Epsam a more lax stone, like a hardned clod, incrusted with a grey chalky coat, which Acids wrought on with Ebullition, but did not slack in the Water, weigh'd in the Air two Ounces and 47 Grains; in the Water one Ounce, one Dram and 26 Grains.

Dulwich a darker stone and very hard as Flint, and inclin'd to a greenish in the body of it, in several places, and the *Cellula*, smaller than *Woodham-Ferrys* or *Harwich*, or any yet observ'd by me; where not greenish, it had many sparkles of shining small Particles, and when beaten fine, was whiter than any. In the Air two Ounces and 47 Grains; in the Water one Ounce, two Drams and 39 Grains and a half.

Woodham-Ferrys Cells as the former but larger, the body oft greenish where expos'd to the Air, else Loam-like, but the *Gypsum* seem'd to have penetrated the body of the stone. In the Air two Ounces and 46 Grains and a half; in the Water one Ounce, two Drams and 17 Grains.

Common Loam in the Air weigh'd two Ounces and 49 Grains; in the Water one Ounce and 67 Grains.

Chalk in the Air two Ounces and 47 Grains, and in the Water one Ounce, one Dram and one Scruple, besides four or five Grains lost by its slackning.

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The Salts extracted from the Stones, they all smelt Lixiviat in boyling.

Richmond stones *Lixivium* with *Lignum Nephriticum*, took the colour of Rhenish or White-wine, or near a Buff-colour.

With Tincture of Logwood, a Red tawnyish. Gall, a faint Tincture of Red but clear.

Turnsole Liquor, sharpened with Spirit of Vitriol, it brightned the Red a little.

Oyl of Tartar *per deliquium*, no alteration, but did not readily mix.

The Lye of the Roasted *Richmond* Stone, With Tincture of Logwood, brighten'd the Red higher than Pump-water.

With Turnsole preserv'd the Red.

With Gall a high Lemmon colour and clear.

Lignum Nephriticum clear and not colour'd, as Spirit of Vitriol does.

Oyl of Tartar *p. d.* thick large curdle.

The Lye exceeded not Pump or common Water in weight.

Aqua fortis wrought violently on this Stone, but extracted no Tincture, but jelly'd, but not so firmly as the other; no Precipitation could be obtain'd from the Jelly.

No Efflorescence when mix'd with common Salt, and expos'd to the Air some time, as mineral bodies do.

Dulwich raw stones *Lixivium* remain'd thickish, white, and of taste brackish;

With *Lignum Nephriticum* a deep *Malaga* Sack colour, and not very clear, as Alkalys.

Redded the tawny of Tincture of Logwood deep, as Alkalys, though not so purplish, but near that of Acids.

Gall yellow like small Beer, and very thick, did not precipitate, though it stood a night, the cloud gather'd upward, and at bottom more clear, like common Salt. Tunsole it dull'd as Alkalys toward a Blew.

Liquid Salt of Tartar it curdled large and precipitated, as *Sal Marine*: Upon the whole it resembled common Salt, especially with a little of the Nature of *Sal Gem*, or withall somewhat Alkalifat.

The Lye of *Dullwich* Stone Roasted.

With Tincture of Logwood a dull Ale-colour, as Cellar-Salt and Glaubers Salt.

Gall, a pale Red, not more cloudy than the Lye.

Liquid Salt of Tartar a thick curdle.

Syrup of Clove Gilliflowers took away the Red, and rendred it durty and dark, as Alkalys effect.

With *Lignum Nephriticum* a pale yellow and clear, which grew thicker upon standing six or eight hours, like Spirit of Salt.

Solution of Sublimate, no alteration as Vitriols.

About six Drams with an Ounce and half of *Aqua fortis*, made considerable Effervescence, and

and thickned in two or three hours to a Jelly, of a grey dirty colour, the powder of the Stone not settling to the bottom. *Aqua fortis* on Chalk wrought thickned a little, but not Jelly'd; on common Loam did not work. Brick Earth only a small Effervescence; *Cimolia purpurascens* alter'd not. I essay'd *Tinore*, Cellar-Salt, and *Lapis Calaminaris*, which last communicated only a dry Taste more Corrosive.

Half the Jelly dissolved in a great quantity of fair Water, precipitated not any heavy Powder, the dirt flying about in it light. The other half distill'd, sent over a Liquor near the scent of Spirit of Salt, but no Butter.

The Earth expos'd to the Air, had no Efflorescence.

Dulwich Stone melted with Glass, did not tinge the Glass, but penetrated the Vessel it was melted in, which was of Tobacco-pipe Clay, which broke smooth like *China*; an effect which the other stones, melted at the same time, had not.

Woodh-m-Ferrys stones *Lixivium* tasted sweetish; Redded Tincture of Logwood near a Claret, but deeper and darker: With Gall whitish and turbid as Nitre (Note, that this was made of the burnt stone) but with some Gall flying in it and curdled, which is the effect of *Salpetre*.

Lignum Nephriticum it took a clear Tincture from, and of a Canary colour.

The

The stone wash'd, Jelly'd in *Aqua fortis*, from which nothing could be separated by Sublimation or Precipitation; no Efflorescence upon the exposing it to the Air, nor was any Metalline Tincture discover'd by Fusion with Glafs.

Epsam stones *Lixivium* with Oyl of Tartar *per deliquium* grew white and thick, with Gall a fine and clear Yellow.

With Tincture of Logwood a dull pale Tawny.

It slack'd not in Water, it jelly'd not in *Aqua fortis*, the Powder remaining heavy and close at the bottom.

I boyl'd some of the Stain in Lye, and in Water sharpen'd with Spirit of Nitre, I infus'd some, but from neither could make any discovery by Colour or Precipitation. So now I come to the Essays of the Waters, and Nature of the Salts therein contain'd.

Selenitical Waters.

Ebbisham commonly *Epsam Water* in
S U R R Y.

E*psam* Water was the first of the Purgings kind discover'd in *England*, viz. 1630, or soon after. The Hill is a Clay of a brown colour

colour and reddish; and where the Wells are more grey.

The Well is about twelve foot deep; the Earth where the Spring is, afforded the Selenites plentifully, at a private Well they were Columns, the sides and superficies of which were inequilateral Parallelograms posited with their edges downward, and their ends meeting in the centre: In a Well a few feet distant, and at the publick Well, they were Rhomboid. At both ends of the Town is Chalk dug, and the Hill here and there hath veins of blew Loam. Of the private Well which was newly sunk, I inform'd my self by examining the Earth cast out of it, which I receiv'd of the Owner Mr. *Symonds*, together with this Account.

The upper Earth, for two Spit deep, was the same; then they came to a harder and Loamy, which lasted about seven feet; then to a looser, which sparkled with small Selenites, as at the publick Well; this held for two feet, where they came at the Stones and Water together: The Water in Summer-time flow'd in at the rate of an Ale-barrel in 24 hours. Below the Selenites they came at a dead heavy Earth and black, partaking of Iron, under which was the common dead Loam, or Cortex of the Mineral Region: And though they dug three or four feet deeper, yet neither was Water or the former signs found. As the Selenites had somewhat of the

the shape of Vitriol of Iron, so where they lay, were veins of Iron and colour'd Earth; the Iron was pure, and obey'd the Load-stone; the Earth, which was either of a Brimstone colour, or that of Iron rust; I prov'd by washing to be the same, only joyn'd by an Acid Juyce like Spirit of Vitriol, which in the yellow had no taste of the Iron, but a distinct pleasant Acid; which with the Jellying of some parts of the Earth in *Aqua fortis*, especially of the whiter part of it where the Selenites lay, is what I observed there. I shall not therefore repeat my Tryals of the Earths, which were fruitless.

The Water is moderately clear, of Taste bitter, together with a mankish Saltishness, not manifestly Lixiviar, but a little of the taste of the second Salt of Salt Marine, and of that Cellar Salt that is gather'd by things hanging in the middle of Cellars, and not what fixes to the Walls.

Epsam Water precipitated not Vitriol dissolved in it, but promoted its atramentous Quality, as doth the Salt, not precipitating the Colour, as Salt of Lime or Chalk, nor turning it red, as some others, particularly Salt of Cellars. Notwithstanding this, it agreed with that sort of Alkaly particularly which is calcareous, in that it restor'd the blew of Tincture of Turnsole sharpen'd; it took a Purple with a Tincture of Logwood in common Water lively and full, not dull red a little purplish

purplish and dusky as Salt of Tartar made with Saltpetre, and Alkalys produce; nor tawny as Salt of Cellars. Further, as Salt of Chalk, it troubled a Solution of Sublimat in fair Water, and sent down a white precipitate, which Alum doth not. With Syrup of Violets a Grass-green, as the same Salt. Yet it peculiarly differ'd from the Salt of Chalk, and all grosser Salts, in taking a high Yellow, and clear Tincture from Gall, which is peculiar to Spirit of Nitre, it being not of the Nature of Saltpetre, which is the only Salt that takes a pale but clear Tincture. With Syrup of Cloves it became dark sooty and greenish, as do Alkalys and Fuligo of Vitriol, that adheres to places where the Fume of boyld Coporas comes.

✧ The peculiar Nature of the Salt of this Water is, to be Calcarious, yet agreeing with Vitriols, and particularly to resemble Spirit of Nitre, rather than Nitre it self; yet to resemble the Salt of Chalk, in precipitating a Solution of Sublimate, which Spirit of Nitre will not.

The Acidity that came over in Distilling, was little and pleasant.

The Salt Grey near a White, and unfigur'd, or incapable of Christallization, but soft like *Barbadoes* or *Lisbon* Sugar. It did not cast up a Scum till it was near boyled up, and the Salt precipitated in boyling. This Salt was wrought on by Acids, yet it coagulated Salt of Tartar rendred

rendred Liquid, called *Ol. Tartari per dilig.* it did not inflame with Sulphur, but blister'd on a hot Iron, and was not Caustick either burnt or unburnt. The Earth of this Salt was white, and dissolv'd in part in distill'd Vinegar, and was about an eighth of the Salt. The Salt of the Water which is said to amount in some dry Seasons to the proportion of seven Drams in a Gallon, scarce then exceeded the half of that quantity after a wet one, when I had it, indeed not so much. The Salt purged pleasantly in the quantity of half an Ounce as I try'd it, but it seems to require a very gentle Evaporation to the due Preparation of it, that Acidity of Alkalifateness may be preserved entire. This Salt dissolv'd in some of its own Water, deepned the yellow colour of Galls to a Pink, and at last to a Red or very near, as Spirit of Nitre does upon long Infusion, but thickish as embody'd Salts. I saw some Salt boyl'd up in Copper, without any Verdigrease Tincture, so mild is the Acid.

Acton Water in Middlesex.

THE Earth of this Well afforded Rhomboid Tale, as a Gentleman that liv'd at the place, and inform'd me, express'd it: Much Nitrous Efflorescence appears in the Clay about the Well.

The Spring opens Northerly; is reputed one of the strongest Purgers about *London*: It is noted to occasion a great Soreness of the Intestine and Fundament, which is reasonably refer'd to the quantity of Salt they wash from the Body, but the Penetration of the Salt of the Water, may make it more pungent and keen. The Water was whitish, not so clear as *Epsam*, not saltish, but rather to me seem'd sweet, with a little of the Bitterness of *Epsam*: It curdled with Soap, as do all.

The Salt of this Water is soft, and not christalliz'd, wherein it agrees with *Epsam* Salt, though I thought scarce so soft. The distinct Nature of this Water, or Salt of this Water, consists in, that this Salt is more Calcarious, or of the Nature of Salt of Lime, for the Water, boyl'd high, disturb'd a Solution of Sublimate in fair Water, whence it precipitated a yellowish Sediment, a little more yellow than the Water, which it left white. And this Salt is likewise more Nitrous, or hath more of the Nature of the Salt of the upper Soyle, as appears, in that it takes a pale Yellow from Gall, but dusky and disturb'd, as common Salt doth effect; not so dirty, nor so apt to precipitate, as *Sal Calcarium*. With Syrup of Violets it took a Green, with Tincture of Logwood made with Brandy a deep Red and purplish, as Nitrous Salts do with cold Tincture of Logwood, which hot would give a full Purple. The Salt
did

did not precipitate fine Silver out of Spirit of Nitre, which common Salt would. A Pint and half of the Water yielded forty eight Grains of Salt, in which was six Grains and a half of reddish Earth, on which Acid Spirits wrought. The Earth precipitated in Boiling.

Colchester Water from the North end in
ESSEX.

THE Water boyl'd Meat without discolouring the Flesh, which it rather whiten'd. The Water was much the same with *Acton*, giving with Tincture of Logwood a purplish Red a little Tawny; and with Gall a clear Yellow and pale, but in half an hour grew turbid, with a whitish Cloud: But with *Lignum Nephriticum* it became a little darkish but clear, a little toward what Spirit of Vi-triol does.

Woodham Ferrys in Essex, being a Chalybeat, is reserv'd to that Class.

The Water at Kensington.

THIS Water claims the principal Place, being made Illustrious by the Town, in which His Majesty hath been pleased to fix his Mansion Palace. The Selenites found at this Well, hath much the face of those cluster'd Columns form'd at *Epsum*, but with this difference, that this at *Kensington* is depress'd and flat on one side, as they are prominent on the other; and at the base or flat side are more truly separable than the Selenites of these Waters usually are, and so nearer resemble the *Muscovy* Glass. The Pyrites which I received from this Well was very hard, of a greenish Gray or Hazel colour; and it differ'd from all in wanting the crust of *Gypsum* or *Trichitis*, so upon infusion of *Aqua fortis* it did not coagulate into a Jelly; but yet after the working of the *Aqua fortis*, which was very violent, the Powder settled not, but remain'd of a yellow or Iron rust colour, flying or turbid, though it stood some days: The Mineral Matter therefore being receiv'd, or taken up by the *Menstruum*, I Diluted that with fair Water, and found it taste Ferruginous, and not much abated of its Corrosive Acidity.

This Liquor which remain'd clear upon the Settlement of the Powder or Dust, upon further Diluting sent down no Mineral parts,

but upon mixing a little powder'd Gall, turn'd immediately of a blew Black, as is the Property of Iron to produce. Distill'd Vinegar on this Stone made no Effervescence, yet extracted the Chalybeat parts, as appear'd in the Taste. The weight of this Stone was one Ounce and one Grain in the Air, and just six Drams in the Water, which was the weight of the piece which I had.

The Water was clearer than these usually are, and less bitter than *Epsam*, but of a more manifestly Saline Taste. In the Quantity of nine Ounces and five Drams, and 48 Grains, it outweigh'd common Water 37 Grains. Its Alkalifate Nature appear'd, in giving a Red in ~~the~~ to a Purple with Tincture of Log-~~wood~~ in that Spirit of Nitre did not disturb it, in that it troubled and rendred Milky a Solution of Sublimate in fair Water, and sent down a white Precipitate as Salt of Chalk doth, and in giving the same Green with Syrup of Violets. It became dark and sooty with Syrup of Cloves as Alkalys, yet not so much Alkalifate as to turn greenish, nor indeed to lose all the Red. It had an Acidity, in that it curdled Spirit of Harts-horn, and the same it produced with the *Lixivium* of Salt of Plants. With Gall it became thick and white, as the Salts of Earths that are not perfectly Nitrous, but of a mix'd Nature, or where the Acid and Salt disturb each other or oppose, Earths, as they approach to Nitre, or
are

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are more Alkalifate, darken this white. With *Lignum Nephriticum* it took a deep Yellow, or Orange, and clear as Alkalys produce. With Iron and Gall it took a reddish Black and rusty, as Alkalys, and not apt to hold it without Precipitation.

I found in two Quarts about 40 Grains of Earth, light, leafy and gray, which Distill'd Vinegar wrought on. The Salt was soft and unfigur'd mostly, but had some *Stiria* form'd in it, flat and not pointed, at least most of them.

This Salt melted not easily as *Epsam* Salt, but bore a good Heat, and had a much greater quantity of Earth in it, the hardness of which was felt on the Tongue in tasting the Salt. Much Earth precipitated in boyl'ing as others, but it bore not readily a Scum, till near boyl'd up, at least as in making other Salt, till the falling of the Salt.

I judg'd this Salt of the Nature of an Alkaly, and of kin to *Epsam*, but yet to differ, being not so resembling the Spirit of Nitre, in the Tryal with Gall; and accordingly that Water increas'd Ink-making without turning it Red; so that this seems more related to the gross or embody'd Salt, which accordingly makes it disturb a Solution of Gall.

This Water differs from the rest, in that it troubles but very little a Solution of *Sal Saturni* in common Water, in which it resembles more *Salpêtres*, which doth not dis-

sturb it at all. The Salt of the Water did trouble a Solution of fine Silver in Spirit of Nitre, which in a long time precipitated, the Precipitation was neither so quick, nor so full, nor in so large Curdles as common Sea-salt or Rock-salt doth it.

Puring Waters in an even Loamy Clay,
more Simple and not variegated.

Richmond Water in SURRY.

THis Water is a level Spring; the Wells are on the side of the Hill a few Rod from the River *Thames*, in a brown loamy Clay, which are about nine feet deep to the bottom of the Water, as the Digger inform'd me there. There is a Tile-Kill adjoining to the Ground where the Wells are. This Water was first discover'd about 1686, the account that the Possessor of one of the Wells, *Mr. Brown*, gave me, was, that the Earth was an even Loamy Clay, that the Water issued into the Well from the side, among the Stones, whereof I brought away as many pieces as I could dispose of. No *Selenites* found here. The Loam and Clay about the Wells had a Nitrous Efflorescence; the Earth above, and about *Richmond*, a Gravel.

This

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This Water purgeth well, but I think scarce so much as *Epsam* and *Atton*, but more smoothly. The Water is smooth on the Tongue, scarce any appearance of Bitterness, salutes the Palat with the taste of common Water, but leaves a farewell a little nauseous and sharp.

The Water curdled Milk, but not so hard or strong as others; with Syrup of Violets a mild Green, not so deep as Vitriols make; it resembled common Salt or a Vitrioline, in that Spirit of Nitre drop'd into it, made no Alteration, though the Water was boyl'd half away: Spirit of *Sal Armoniack* rendred it thick, white and curdled, and sent down a large Precipitate. Spirit of Harts-horn made a small Curdle and Precipitate. Spirit of Salt no Alteration. With Galls it grew immediately turbid, white and thick, not Milk-white, like what Salt of *Hungarian* Vitriol produceth, not dark as Alkalys, not coloured as common Salt, not clear as *Salpetre*, nor reddish as Chalk, nor dark, and ready to precipitate the Colour as Spirit of Vitriol. The Water standing a while on pieces of Iron, with Gall, chang'd dark with a reddish cast, as Alkalys render Ink. In both these it resembled Salt of Cellars; yet differ'd in giving a wan dusky Red with Syrup of Clove Gillyflowers as common Salt, and redding Tincture of Logwood as Acids.

☞ The Salt of this Water hence appears to be Acid, of a Vitrioline Nature, yet to be a little Alkalifate or Nitrous, not so deeply

as Alkalys, but resembling the Salt embodying Vitriols, or the uniting of Vitrioline Salt with the Salt of common Earth, and which our common Water contains.

Richmond Water distill'd in a Glass retort, yielded a Water which was Acid enough to redden a little the colour of Syrup of Violets, and to give a faint Red with Tincture of Logwood, but took no Quality from Iron; and it was very light in weight, equal to *Tunbridge* and the light Chalybeats.

The Salt was gray and figur'd like the *Bacilli* of Nitre, flat and long, and many of the *Spiria* were pointed like Needles, some *Prisms*, some *Camella*; it melted not easily, yet I thought sooner than Vitriols. It chang'd not the colour of Salt of Tartar, but curdled its *Deliquium*; inflam'd not with Sulphur. The Earth was smaller than in most Waters, was gray, and Acid Spirits as of Salt; *Aqua fortis* and Spirit of Nitre would not touch it: It alter'd not in the Fire, but made a small De-crepitation or Spitting, I judg'd a little more than Allum. The Salt of this Water did not disturb nor change the colour of Sublimate Water, which Alkalys and Salt of Cellars does. It was a little sweetish, and not cold as *Salpetre* is.

The Stone found in this Well resembled Loam: The Loam cast up for Tiles in the Ground joyning to this Well, had a Nitrous Efflorescence.

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The Stone had a Tincture of Iron. The Tile-earth in the Ground adjoyning, I infus'd in warm Water sharpned with Oyl of Vitriol. This Water gave a Green with Syrup of Violets, and with Tincture of Logwood a sooty dusky colour a little reddish.

Dullwich Water

HAS its name from the Town near it, but the Wells are in *Lewisham* Parish in *Kent*: The Wells are in the foot of a Hill, about twelve in number: The Hill and Ground adjoyning, is a stiff Clay with some Wood upon it: These are next in Antiquity to *Epsam*, being discover'd about the Year 1640; The Hole dug is about nine feet deep as I judg'd, and the Water about half a Yard deep, being usually emptied every day: The bottom is a Loam as is the Hill; and where the Water issues in, is found the *Lapis Lutoso-Vitriolicus*, which glitters with Vitriolick sparkles, and is divided into Parcels by the *Trichitis*. This Water purgeth very quick, and are not to be drank by a Body out of Temper, or Heat by walking without inconvenience. I was there *July* 1696 after some wet days. This Water is bitter like *Epsam*; it curdled with Soap or Milk much more than *Richmond*, and equal to *Epsam*. Taken the same day

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with

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with *Richmond* in the quantity of nine Ounces and near a quarter, was 28 Grains heavier than common Water, and 12 Grains than *Richmond*.

With Gall it turn'd 1st yellow and clear, then thick and muddy, white and a little yellowish, in which it resembled common Salt; and with that it agreed in making no alteration in a Solution of Sublimate, and in making an Effervescence with Spirit of Nitre, and in not disturbing Spirit of Salt. It agreed with Acids, in not relieving the Red of Tincture of *Turnsole* sharpened, in curdling Spirit of Harts-horn very much, but Spirit of *Sal Armoniack* very little, or rather in a more fine Curdle: In which Trial this resembles common Salt more than *Richmond*, which curdles the last most, and in giving a Red with Tincture of Logwood. The particular Nature is somewhat pointed at, in that this Water after an Infusion some hours on points of Nails, with Gall became dusky and thick of a foot colour, which precipitated and left the Liquor yellow; in this it differ'd from Vitrioline Salts.

The Stone prov'd it self to have much of the Nature of Rock-salt, such as is brought from the West of *England* near *Chester*.

The Salt shot into *Stiria*, which being heat, blister'd and lost much by a hot Fire, so as to have only 12 Grains remaining of 40, but this was done in Earth; the more fix'd parts remain'd

remain'd angular and flat like Sea-salt: The stone melted, pierced the Clay readily, and made it break like China.

The Calx of the Salt remain'd Gray.

Though I must not adventure to determine the particular Nature of the Salt of this Water, which made the stone sparkle, yet I may say it is Marcastical, and that it contains no fresh or new Metal or Mineral, but that it varies in the Salt (as the Gravels and Loams meeting and joyning, produce the common Vitriol stone) which here seems of kin to that of common Gravels, and that it has some cold Nature proportionable to such an Original, but fluxile withall, being apt to set the Blood flowing.

The Salt I conclude by the Essays, to resemble common Salt, and to be of kin to Mineral Salt, as is our Rock salt, but yet to differ in its being more Penetrative and Fluxile, and not of the Nature of common Salt, which precipitates not Vitriols.

North-Hall Water in Hartfordshire,

WEigh'd heavier than *Epsam*, and pleasant, not so nauseous to taste. It preserved the blew of Syrup of Violets, which Nitres and Alkalys chang'd to a green. It disturbed not a Solution of Sublimate in common

mon Water: It was not acid enough, nor Alkalifat enough, to give either a red or dirty brown with Tincture of Logwood, but gave it a yellow which grew paler upon standing, as I judged somewhat like Glaubers Salt, which is made of common Salt and Spirit of Vitriol, and which likewise purgeth: It took very little yellowness from Galls, and what it took it would not hold, but suffer'd to precipitate presently: The first being the effect of Spirit of Salt, the last of Spirit of Vitriol. It curdled soapy Water in large Curdles, and *Ol. Tartari per deliquium* the same; and upon shaking, this Water rais'd a great Froth, which it kept a great while. I judged therefore this Water to contain a Salt resembling common Salt, and that part of it which is condens'd and christalliz'd through Cold in a Humid as in Cellars, the Coagulation with Liquid Salt of Tartar being not so universal, as with the other part of common Salt.

Lambeth nearer Well in Surry.

THIS Water, beside the Virtues which it hath in common with other Purging Waters, has the Property of curing Leprosies, and cleansing and clearing Scorbutick Scurs and Spots; which how the Nature of the Salt accounts for, is worth Observation. This Water

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Water try'd at the Well after a dry Season was clear, but not so Limpid as common Spring Water, having somewhat of the colour of Rain-water; it was of the taste of *Salpetre*, or nearer *Salpetres* second Salt, but left a Vitriolick brackish or nauseous taste on the Palat. Half a Pint and half an Ounce of this Water, exceeded common Water in weight 24 Grains; it made no alteration in a Solution of Sublimate in fair Water, which Nitre and Alkalys disturb; it agreed with common Salt, in changing the Red of Syrup of Clove Gilliflowers into a cloudy pale colour, in which the Red upon 24 hours standing was wholly lost, but was restored by a drop of Spirit of Nitre; it had the Effects of the same Salt in curdling strongly with *Ol. Tartar. per deliquium*, in giving a pale yellow not very fine with Gall; and with Tincture of Logwood a brown, exactly resembling Ale that is not fine, a little browner (if any thing) than what common Salt produceth. But in this it agreed with *Salpetres* second Salt, and it disturb'd a Solution of *Sal Saturni* in fair Water, just to that degree that *Salpetres* second Salt does; and with *Lignum Nephriticum* gave a Whitewine yellow and clear quickly as *Salpetre* does; common gravelly Spring-water gives near the colour but upon longer standing. It agreed besides only with Glaubers Salt in the Essay with Gall and Logwood. The Water standing on Iron 24 hours,

hours, gave with Gall a reddish Purple, which turn'd Inky, and although the grosser parts precipitated, as where there is a mixture of Nitre, and in the Vitrioline Waters impregnate with the Salt of the upper Soil, yet the colour remain'd in the clear Liquor much deeper than a Violet, though it stood open some days. This one drop of Spirit of Nitre turn'd green as it doth Ink made with English Vitriol: A drop or two of this in common Water in a Gravel resumed the Red. This Water precipitated fine Silver out of Spirit of Nitre, but not so quick and strongly, I thought, as Rock-salt and Sea-salt. This Water accordingly changed not the colour of Syrup of Violets, neither doth common Salt.

Thus the Salt of this Water agreeth with common Salt, but comes not up to its power of Precipitating or Coagulating, which Properties would rather set and fix the Humour, and so promote the Distemper, as appears in the Effects of Bay-salt to produce the Scurvy, which Property is observ'd to lye in the hardness of the second or less coagulable part, and not to be found in the Salt when purified.

It agrees in some Tryals with *Saltpetres* second Salt, which is not wholly differing from common Salt. But because Salts differ, I examined the Water more nicely. It disturb'd a Solution of *Hungarian* Vitriol which common Salt did not, Rock Salt very little, but the

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the second Salt of *Saltpetre* readily effected likewise, but scarce in so high a Degree, for this sent down a yellowish Precipitate forthwith; yet it did not trouble a Solution of Mercury Sublimate as *Sal Gem.* nor precipitate it as do the Nitre and Lime-salt of a yellow, or as Salt of Chalk and Marle white.

The Salt was gray near white, mostly near Cubes, or in thick plates as common Salt, some scurfie light parts with it, which was the Scum which precipitated in Boyling, no Stirræ or pointed parts could I observe. The Water did early raise or bear a Scum. The Salt readily ran *per deliquium*, and left a leafie Earth and grey about 24 Grains out of a Quart of Water: This leafy Earth was very light, and made a very small Effervescence with distill'd Vinegar, nor would it wholly take away its Acidity.

This Salt precipitated fine Silver out of Spirit of Nitre in hard large Curdles; *Saltpetres* second Salt only whitens and disturbs the Solution which at last precipitates it. *Ol. Tartari per deliquium* works on it, but does not precipitate the Silver: But this Salt, I thought, did scarce so fully precipitate the Silver as Rock Salt.

☞ I therefore refer the Nature of the Salt of this Water to that of common Salt, whose power it hath even to the depurating a Solution of Vitriol, but without either so gross and

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and strong an Earth, or so severe and coagulative an Acidity.

The Diseases that have been cur'd by these Waters, as I found them registred in a Table at the Well, were as I remember, *Leprosie*, *Scurvy*, *Vertigo's*, *Jaundies*, *Worms*, *Stone* and *Colick*,

To understand on what account this Water exerts its power, beside Worms, which every one knows to be destroy'd, and the flatulent putrid matter suppress'd by Sea-salt, I think the *Leprosie* may well illustrate. To have a Notion of the Nature of this Disease, It is not necessary here to inquire into the particular Juyce it is seated in, and Vessels serving it; it is sufficient that the Nature and Genius of the Humour or Salt is toward an Alkali, exulcerating and dry, seated or produced by too thick and luxuriant Chyle, in too nitrous or scorching a Climate: That the Cure of this Disease consists not only in some Qualities that mortifie it, but in some pungent parts that can retain their Nature, and are apt to separate the grosser parts, we are taught by the success of Vipers in this Disease, which have a Faculty of separating Tartar from Canary in which they are infused, which else yields none. On which, by the way, I must observe the Error in choosing that Wine for the Infusion, on which the Virtue of the Vipers is in so much measure lost,
 propo-

proportionably to the demand of the thickness of the Liquor. If this be conceded, I think it must be allow'd, that as the Nature of this Salt is disposed to mortifie Alkalys, and to penetrate without Corruption, so its being void of that severe *Congulum* may qualify it to separate and discharge. And that I beg not much in this Notion, will appear in the opposite Salt of *Brentwood-Weale*, which I have experienced to encourage and increase this Disease.

The Water of the farther Well at Lambeth.

THIS Water in Taste came nearer common Pump Water, agreed with the other Water in every Tryal, as well by weight as otherwise; only Syrup of Cloves did not wholly lose its Red, neither did a drop of Spirit of Nitre restore it, as it did in the other: Whence it appears to be of a less Vitrioline Nature, or not so affine to Sea-salt; and so may be more fit for general drinking, though not so satisfactory to the particular Intention.

The Purging Water of Alford in Somersetshire.

THIS Water is of kin to the other: The Acidity not Volatile or alterable. *Gall* and *Lignum Nephriticum* gave it a very pale yellow, but the *Lignum Nephriticum* somewhat deeper than the *Gall* or *Saltpetre* does. With Tincture of Logwood an Amber colour like Glaubers Salt and Salt of Cellars, and not far from that of *Saltpetre*. With *Gall* and Iron it gave a right Purple colour, as Mineral Acids, and which *Saltpetre* does: It differ'd from *Saltpetre*, and seem'd between that and common Salt.

The Water of Brentwood-Weald in Essex.

AS *Lambeth* Water and *Woodham-Ferry*s, I have experienced specifically proper and effectual in Leprous Diseases, so this is considerable in its opposite Nature, which* I have likewise experienced.

This Water is of Taste Lixivate, with a little Bitterness, and not free of the maukish taste of the rest, but not so nauseous as *Epsam*. With Syrup of Violets it gave a full green as Alkalis, with which it agreed in giving a dusky

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dusky Gold colour near that of *Malaga Sack* with *Lignum Nephriticum*, in turning thick and dark with Iron and Gall, not black or blewish as Vitriols, common Salt and *Salpetre*; and which precipitated as the blacks made with Alkalies. And lastly, in not precipitating fine Silver out of Spirit of Nitre, more than fair Water will.

It distinguish'd it self from Vitriol and Alum, in growing thick and whitish with Gall, as Nitre of a mix'd nature do, or Vitriols and common Water; the same standing became a pale yellow, which precipitated as it would in a Solution of *Salpetres* second Salt, or near the effect of common Salt: It gave a Red with Tincture of Logwood (as Cellar-salt but more red) which Vitriol blackens and Alum purples. With Syrup of Cloves it gave a dull pale with a blewish cast, as Alkalies do, but more like to *Salpetres* second Salt.

With a Solution of Sublimate no alteration; nor any change or Precipitation or disturbance in a Solution of *Hungarian Vitriol*, in both which it agreed with a Vitriolick Salt, as almost if not altogether all these do.

With a *Deliquium* of Salt of Tartar it coagulated extreamly hard like stone, as the second Salt of *Salt-Marine*.

A Solution of *Sal Saturni* this Salt rendred white and thick like Milk, in which it differ'd from *Salpetre*, which doth not disturb it, and from *Salpetres* second Salt, which disturbs

disturbs it but a little. This Water in boiling threw up much of the Salt in the Scum, as *Sal Gem.* doth, and had some gross earthy white Flakes precipitated.

The Salt was white, and shot in very small *Stirra* or flat *Bacilli*, most of them pointed, some not; these did not readily melt. The Earth too was white and in great quantity, being near a fourth part. Some part of the Salt was stain'd yellow, having some of the Soyl in it. Some part of the Salt which was the last, was not shot so discernably, but was in hard lumps, and seem'd to consist of a second Salt, that is of a somewhat differing Nature. This did differ from the other in making a greater Precipitation of fine Silver out of Spirit of Nitre, and a greater Coagulation of the Liquor of Salt of Tartar.

The Salt wherewith this Water is impregnate, appears to be a full Alkali (and the deep red with Tincture of Logwood made with Spirit of Wine does not contradict it, Alkalies giving not much deeper with that Tincture) joyn'd with a hard coagulating Acid not of the Nature of common Salt, but rather of Saltpetres second Salt.

And according to this Nature of it, this Water will not keep sweet four days, whereas the others will near three times that time.

That this should be injurious in Leprous cases, is very intelligible, from its Alkalifaceness to raise the Blood and ulcerate, and its coagu-

coagulative Acidity. And it is observable, that the *Lambeth* Water is exactly of the contrary Nature, containing a Salt affine to Sea-salt, but without the Severity of the Acid or coagulative Quality. This Water of *Brentford* I have experienced beneficial in Hypochondriacal cases, particularly at the beginning. But the difference of the Constitution of the Patient is necessary, to be consulted, in order to the due Prescription of these, as well as other Waters, since either the different Nature of the Salt of the Blood, or a peculiar Mechanism of the Body, may make it lyable to receive great Alterations according to the Nature of the Salt.

This is clear in the present Instance, for whereas the Melancholy and dull Crasis of this Patients Blood, made this a suitable Remedy, yet I observed in another Gentlewoman of the same Years, but of a Florid Sanguine Complexion, this Water to be of so differing an Effect, as to cause Violent Flushings of the Body and Face, and an Obstruction of the *Catamenia*, all which the Nature of the Salt accounts for.

Upminster Water in Essex,

WAS very clear, of taste bitter, with a sweetish nauseous taste. In the quantity of nine Ounces six Drams and six Grains, out-weigh'd common Water 55 Grains: The Water curdled *Oleum Tartari per deliquium*, but not very large nor very quickly; curdled Spirit of Harts-horn strongly; its Alkalifate nature appear'd in thickning a Depurated Solution of *English* Vitriol, and much sooner a Solution of *Hungarian*, and making a large Precipitation: In taking a high yellow Tincture with *Lignum Nephriticum* near an Orange; with Gall a Turbid dark and greenish, which precipitated, leaving the Liquor yellow; in making an Effervescence with Oyl of Vitriol; in giving a Claret-red with a Tincture of Logwood in fair water mix'd without heat; in taking a dark sooty thick colour with Syrup of Cloves. In the Verdigreese green with Syrup of Violets, and in troubling a Solution of Silver in Spirit of Nitre, not so effectually as common Salt: It differ'd from Saltpetre in rendring a Solution of *Sal Saturni* milky: It differs from Alkalies, in that it makes no alteration in a Solution of Sublimate made in fair water.

Barnet Water in Hartfordshire,

WAS very clear, had much the taste of common Pump water, but with an addition of bitterness, though less than in the other; in the quantity of ten Ounces, this Water, taken in Summer-time, as were the others, surmounted common water in weight near a Dram, or within a Grain of a Dram. The Salt of this Water exactly answer'd a Salt Alkalifate, particularly that of Chalk in all Tryals; with Gall it became thick, disturb'd, and whitish, not free of the yellow Tincture; with Syrup of Violets a deep Verdigreese green; with Syrup of Cloves a sooty dusky colour; with Tincture of Logwood cold an Orange tawny; with *Lignum Nephriticum* yellow and clear: It rendred a Solution of *Sal Saturni* in common water milky: It rendred a Solution of Mercury Sublimate milky: It disturb'd and made thick a clear Solution of *Hungarian Vitriol*; and did not precipitate fine Silver out of Spirit of Nitre: The same in all these doth Salt of Chalk only. Moreover this curdled the *Deliquium* of Salt of Tartar, and also Spirit of Harts-horn, but both fine.

Stretham Water in Surry,

OF Odour sweetish; of Taste it was nau-
seous and Saline, not so bitter as *Barnet*,
taken at the same time; and was lighter by
ten Grains in seven Ounces and a half: It
answered the same Essays with *Barnet* water,
only with Syrup of Cloves a little more blew,
like common Salt, or Saltpetres second Salt;
when near boyl'd up, the Salt on the sides in
the cold, shot in long and flat *Bacilli*, not
ready to melt in heat, and had the cold taste
of Saltpetre, but with a sweetness. The bot-
tom had three sorts, some being flat, broad,
and grained like common Salt, and some soft,
like *Epsam*, which had flakes in it; four Scr-
uples of Salt had about eighteen Grains of
Earth; the Earth and flakes were white and
clearish, they burnt white, and Distill'd Vine-
gar wrought on it, but did not take up any
considerable quantity of it.

The Purging Chalybeat Water of Scarborough in Yorkshire.

Scarborough Water is Chalybeat and Purges, it has Qualifications of a Purging Water, the Salt of it is figur'd, approaching to a Nitre, and which is really Nitrous, and the Earth over the Spring shews the Nitrous Efflorescence, that at other Purging Waters is an Index of the Earth whence the Salt is derived.

As Chalybeats, it is a running Spring, and proceeds from a Gravel, and expos'd to the Air, some days loses its power of making a black with Gall, the Salt remaining being purely Nitrous. It has the Virtue of both Waters, and is sufficiently celebrated by the Frequenters of it. And I hence conclude it to be either two Waters joyn'd, or a Chalybeat Water washing a Nitrous Vault. The Spring is upon the Sea-shore, and flows from or near an Alum Mine: It is observable, that other Springs that flow over Alum Mines here in *England*, yet differ not the least from common Water; the black slaty stone not yielding the least Aluminous Taste before Ustion. I shall clear it from partaking of Alum or Sea-salt by Tryals, which will confirm my Account of the other Waters, since it is clear of participating any thing with the Mine

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over

over which it runs, and the Mine would probably discover any other Minerals joyn'd, if such there were; and the same Nitrous Earth here found, that is common to the others, makes this more plain. The proportion the nature of this Salt bears to the Nitre of common Water, and true Nitre, is discoverable by the quantity of time the Water retains its Ink-making quality, Alkalies, and so the true Nitre of the Ancients precipitate their dirty black presently.

The Water was examin'd at the Spring, at my direction, by the accurate hand of my worthy Friend and Ingenious Gentleman Mr. *Edward Carter* of *Scarborough*, in whose own words I shall deliver their Tryals of them, only adding to each a Corollary of the use I make of them.

Quest. 1. What Colour Nutgall gives it, and whether Turbid or Clear?

Answ. A Grain of Gall strew'd upon the Surface of eight or ten Ounces of the Water, doth without any farther mixing, immediately strike a deep reddish purple colour, which presently becometh turbid; if you let the same stand all night, the Water will in a manner recover its pristine clearness; and a Powder of the colour of colcothar will precipitate to the bottom in a large quantity. Or if a few drops of Spirit or Oyl of Vitriol be instill'd into the foresaid Tincture, it will presently be

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be clear as at first, without the Precipitation of any Powder.

The reddish Purple is effected by Alkalifate parts united to the Acid, distill'd Acids do the like; but that the Salt of this Water is Nitrous, is observable in its turbidness, but chiefly in the Precipitation of the colour upon standing, which Precipitation Spirit of Vitriol prevents, though it destroys the colour.

Quest. 2. Has the Water any Scum or bituminous Film.

Answ. When it stagnateth in any place, or stands a few hours in an open Glass, there is an Azure colour'd bituminous Film or Scum upon it, and if the same be expos'd to the Air for about a Week, there is one riseth up much like that which swims upon Lime-water.

The first is common to Chalybeat waters, which appears upon the separation of the Nitrous and Vitrioline parts by the Air, but the latter a peculiar of the Salt, which being not calcarious, I judge to be of such a Quality as complies with the Corruption of the Water, so far as to suffer its grosser parts to be thrown up, which Lime-water does by the motion of its own active Salt; so far it differs from those of the Nature of common Salt which preserve Liquors. *Weal* water has the same Disposition.

Quest.

Quest. 3. What Colour the Water kept three days in an open Glass will take with Nuggall turbid or clear?

Ans. Galls give it a colour then much as before, yet something more remiss, but if it stand longer, as about a week, they cause no such alteration, changing it only into a milky colour, like Barly water, as Salt of common Earth does, which is not Alkalifate.

Quest. 4. What Colour with Syrup of Violets?

Ans. A light Green, which may be turn'd into a reddish Purple, by adding some Spirit or Oyl of Vitriol.

To these Remarks I have added some (which perhaps may not be unacceptable) touching the quantity of Salt and Stone Powder contained in those Waters, its Taste, Odour and Figure when Chrystalized.

According to my nearest Computation, it hath about an Ounce in four Gallons, and almost as much of the Stone Powder, which is of the colour of Sand made use of in Hour-glasses. I never could discover any of the blew Clay, which some pretend to have found.

The Salt hath a very remarkable Bitterness, and when newly made, a strong sulphurous Smell.

The Christsals are very clear and transparent, comprehended under eight plains, two of which are Sexangular, and the other six are Rectangular Parallelograms, which are disposed after this manner, The sides are constituted of the two Sexangular Planes, alternately interpos'd to two of the largest Parallelograms, each side standing at right Angles with the other: The ends are terminated by the four lesser Parallelograms inclining to each other, from the Extremities or lesser sides of the lateral Parallelograms, as the two Lines mark'd with the points and dash. Thus I have described the Form of it as intelligibly as I can in words, but because a Figure will help to explain what hath been said, and be a means to represent the Idea better to the Understanding, I shall endeavour to give you the best Delineation I can.

Half of the Planes or Surfaces may be represented thus, but the other which are opposite, must be supplied by the Imagination.

a exactly represents one of the Sexangular Planes, which hath another like it directly opposite. *c, b, d*, do shew the Proportions of the greater and lesser Parallelograms, but they cannot be represented Rectangular in the Scheme, as indeed they are as was mentioned above, the sides *a* and *b* do stand at right Angles, and so do the sides opposite to them. Thus $\square b$.

Thus

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Thus

Thus far is the Account received in the Gentleman's Letter dated *Scarborough, June 22. 1697.*

Some Chrifitals of the Salt of this Water, with the Earth or ftony Powder of it, I received fince from the fame hand. The Salt was clear and uniform or fingle, and not an aggregate, confifting of *Bacilli* or Columns, nor plected as the Alum there produced appears, the Figure was the fame now describ'd, only one of the ends was not fo exact, being a little broken; and the Chriftal in bulk hardly amounted to half the meafure of the Figure.

This Salt precipitated not fine Silver out of Spirit of Nitre, as Sea-falt, and our Rock-falt does do, yet disturb'd not a Solution of Sublimate, which Alkalies and Nitres do, and which Alum thickens and whitens: A few drops of this Salt diffolv'd in fair Water, rendred a Solution of *Sal Saturni* white as milk, which *Salpetre* does not disturb: It curdled *Ol. Tartari per deliquium*, but not fo strongly as *Epsam* Salt. The Salt inflam'd not upon a hot Iron, though with Brimftone added, nor was very fluxile.

✧ In Sum: The Salt partakes not of either Alum or Sea-falt, but is Nitrous, not of the Nature of *Salpetre* or its fecond Salt, nor fo Alkalifate, as to discover it felf in Sublimate Water, or to give a deep Green with Syrup of Violets, but which allows a mixture with
Vitriols,

Vitriols, and is not so Alkalifate or full of Nitre as to precipitate; but near that imperfect one of our common Earth, and which is not so fix'd, as to keep in one state or Solution of it in Water; but hinders not, if not promotes, the Fermentation or intestine Motion of the Liquor, which it clears by throwing up a Scum. For as far as appears to me, Salts that have a Solidity, and yet a disposition to Fermentation, that in burning throw up a Scum rather than precipitate, as the Salt of *Weal Water*, and that that stagnates on rich common Earth, does among the Nitrous sort. It would be advantageous to the discovery or distinguishing of the Nature and Virtue of this Salt, to put some up in a Bottle with Sack (which is a Wine that makes no Tartar) to observe whether a Precipitation would result, only to Fine it, or a Fermentation or disturbance would be renewed.

The Propriety of this Water consists in the middle nature of the Salt, which keeps thick with Galls, as the Salts that Vitriols embody with effect, which are not purely of the nature of common Salt; yet is so familiar to Vitriol, as not to disimbrace soon; beside the Chalybeat parts, and its less volatile Acidity.

The Chalybeat Purging Water of Woodham-Ferrys in Essex.

THE Earth cast out of this Well contain'd many discolour'd Parcels of mellow Earth, the colours of which were two, that of Brimstone and a Ferrugineous; and which yielded Iron upon Essay when only well wash'd. And as at *Epsom* these Veins attend the Selenites, so the same stone is plentifully found here; most of them were in one half resembling the Rhomboid, the other had a differing Figure, by the declining of the two opposite grand Planes, till they determin'd at an edge, which was Semicircular, as in the Figure. In parcels of this Loam inclos'd, I found great plenty of Vermicular bodies which were mere Iron; of which Metal one *Tubulus Marinus* and several pieces I brought away with me and reserve. The stone or imperfect Marcalite, which I call *Lapis Luteo-siderialis* here, had many shining Particles in it, and consisted of Parcels divided by a thin Wall of Gypsum or *Trichitis*, and precipitated some Iron when dissolved in *Aqua fortis*, and diluted with fair Water.

The Water was clear, of Taste Chalybeat, but had more of the nauseous sweetish taste of the Purging Waters not void of Bitterness; with Gall a thick Purple, as Saline Chalybeats.

In

In the quantity of nine Ounces five Drains and 24 Grains, exceeded common Water in weight thirteen Grains. It chang'd not the colour of Syrup of Violets, it took not away the colour of Syrup of Cloves, which Alkalies do, by inducing a sooty or green, and common Salt, by rendring it pale and cloudy. It agreed with Vitriols and common Salt in making no alteration in a Solution of English and German Vitriol; nor in a Solution of Mercury Sublimate; yet curdled not much or large with Spirit of *Sal Armoniack*, and less with Spirit of Harts-horn; and with Spirit of Nitro. suffer'd no alteration; with Logwood infus'd a Purple, but more toward a Red or Murry. Note, I used in this Experiment, the Water when boyl'd high toward a Salt.

The Salt differ'd from Saltpetre, in rendering a Solution of *Sal Saturni* milky; it precipitated a Solution of fine Silver in Spirit of Nitre immediately as common Salt, yet made with Liquid Salt of Tartar but a fine curdle; with *Lignum Nephriticum* a pale yellow, and thick as common Salt; with Iron and Gall infus'd, a right blew Ink, and which did not precipitate.

The *Kensington* Water gave a more red black, and which soon fell; and with *Lignum Nephriticum* a clear high yellow near an Orange.

This

This Water of *Woodbam-Ferry* did not precipitate any Ferrugineous parts or Okar, upon its losing its power of Tinging with Galls.

Then the Water with Gall took a yellow tolerably clear, but not purely clear of disturbance, near the effect of common Salt.

The Salt of this Water comes near common Salt (Bay Salt with Gall giving a reddish cloudiness) as the other a Vitrioline or mix'd one. The simplicity of the Salt appears in the colour and clearness with Gall.

It precipitated a ruddy Earth in boyling, which distill'd Vinegar wrought on with great Effervescence. The Salt seem'd of two sorts, the first being hard, not readily flowing in heat, and grain'd, and crackling a little in the Fire and leaping. Some flat shoots like Saltpetres *Bacilli*. The Earth contain'd in two Quarts, was about forty Grains.

The Water retain'd its power of Tinging with Galls many days in Glass-bottles only cork'd. It did not readily raise and bear a Scum in boyling.

The Virtues and Use of the Purging Waters.

THE Original and Genius of the Salt of these Waters being thus arrived at, their successful Effects in Distempers, and how these are agreeable to the Nature of the Salt, comes now under consideration, that hence we may be directed to the right and proper use of them. Diseases or more truly Symptoms are so various in their Causes, that, without the Knowledge of these, Observation and Experience it self will be uncertain and unserviceable. Now the Diseases which are observed to be help'd by Purging Waters, as ill Concoction, Pain at the Stomach, Heart-burning, lost Appetite, Vomitings, Cholical Pain of the Stomach, Cholick, *Iliaca Passio*, Worms, Nephritick Pain, Gout, Rhumatism, Heat of Urine, or Suppression of it, Scurvy and its Symptoms, as Itching, Pustles, and the like. Jaundies, Vertigo, Headachs, Hysterick and Hypochondriacal Passions, are all cured by the Waters, only as they fall under this Notion and consideration, That they proceed from a vitiated or delinquent Chyle, and want of due Ferment of the parts, and that the Matter is seated in the first ways, or larger Secre-

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tory

tory Vessels. It is so very material to observe this, as not only to improve the use of them in other Cases, but may likewise help us to avoid the Misfortune of the Empirical use of them in cases where they are ineffectual. Errors of which kind I have observed in the use of the Waters, and indeed of all other Medicines, as the Jesuits Bark and the like. That the Matter ought to be fit for exterminating, I might prove in almost all the Distempers these are proper in, The Jaundies are often cured by the Waters, when they have proceeded from Melancholy, or have been otherwise produced by the foulness of the *Viscera*, or are a Symptom of obstructed *Menses*, or a *Pletthora*, but when Essential, can be as little expected to have a Cure from these Waters, as when it is Symptomatical of a *Feaver*, or a *Venenate Disease*. Vertigo again may proceed from Melancholy, a flatulent foul Stomach, or tough Flegm in the Blood, as in the *Rhumatisme*, or from the nature of the Salt of the Blood, as in *Scurvies*, and in that *Crisis* which attends Women chiefly at the grand *Climacterick* of 50, or from a *Pletthora*, and so may be subject to the reach of these Waters; else in *Cephalick Distempers*, such as *Apoplexies*, *Dispositions to Lethargies*, *Palsies*, and even in *Dropsies*, *Purging Waters* in a general consideration, can never be supposed to be applicable.

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cable. From the same Chylous Recrements, Convulsions often take origine, and may have place among Cures of this kind, and Pains in the Head, but ought to be mark'd with the same Proviso. Accordingly Cautions against the use of them in a *Chlorosis*, Feavers, *Cholera morbus*, and Suppression of Urine from Stone or confirm'd Obstruction, our Reason readily suggests; which too forbids the use of them in Women with Child.

The Qualifications that give these Waters an extraordinary capacity for these Cures, are their Acidity agreeable to that of the Stomach, and which indeed is Vitrioline, their absterfive Salt, of a middle nature between Vitriol and Nitre, quantity of Liquor, and not only their Purgine, but as it is easie without Sicknes or Gripping, or other flatulent Disturbances rais'd usually by other Purgers, and which hinder those calm Effects that are necessary to the relief of some Distempers; to which some would add Coldness, and agreeable bitterness, but this holds not in all. From all which we may reasonably expect success, when a preternatural Salt is to be wash'd away, the Ferment of the Stomach to be restored, *Viscera* to be cleansed, or cooling is necessary. Indeed the Purging Waters, or their Salts, are much the finest Purgers in Nature, and in many of the pre-

ceding Cases often perform Cures alone. They are the best Preparatives to the Chalybeat Waters, and the only Purge proper to intervene in the use of them, where Purging is expedient, because these do it without disorder, and are of like nature. Of what general use these Qualities make this Purge, I need not discourse, especially for prevention, since so near all Diseases are owing to the Vice of the Stomach, or Recrements of the Chyle. But besides this general nature of the Salt of these Waters, it is found of some Specifick Qualities in many of them, which frequently differ from each other, and to have distinct Virtues accordingly. That besides the Purging Quality, and what that can contribute, there is so much in the Nature of the Salt, as may give the Waters the force of a Medicine, may be very easily believ'd by any who will consider of what Energy the Qualities are, that these Salts differ in. The second part of *Sal Marine* is known by Sea-men to produce the Scurvy, and a Salt nearly affine to Nitre the Itch. It is known that Nitre and Vitrioline or common Salt precipitate each other, and must be allow'd to do as much in the Body, and may be observed in the reason of the different Cures wrought by these Waters. Alkalisate Salts and Nitrous, produce a fluor of the Blood, and in the present State of the Air,
which

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which I intimated to be Nitrous or Alkali-
fate, I have found Fluxes frequent I mean
Sanguinary, and have as certainly found Cha-
lybeats and Vitrioline Salts effectual, and ob-
served *Sal Prunella* to increase them, when
used by the less thinking Administrer.

You may observe in *Lambeth Water* a com-
mon Salt, without the severe Coagulum which
accounts for the Virtues. ¹⁰In *Weal* a particu-
larly opposite Nitrous one. In *Kensington*
near a *Saltpetre*. In *Dullwich* a Salt related to
common Salt, but very penetrative and flux-
ile, fit to command a Stubborn Antagonist,
but mischievous to a tender and over-heat
Body, and accordingly I have observed it.
I might go through all the Waters. The
good Effects of the Chalybeat Purgers in
Asthma's, a Dropsie make them a Peculiar
over and above what their Salt would.

And in Salts of the same nature as Nitrates,
some we shall here find of a more open na-
ture, approaching a calcarious one, and so
more apt to correct Acidities in the first ways,
some more lock'd, and so fit to reach them
when digested and remote. In *Weal Water*
I find an Alkaly joyn'd with a severe coagu-
lating Acid, the first raising the Floridness
of the Blood, the last apt to fix the Humour
and obstruct; and may have a good use to
those Complexions that need both these Qua-
lities, as those do that are pale and in-

clinable to be loose body'd. And although in passing of right Judgment, the Consideration of the Constitution and Complexion of the Patient is necessary, and as *Tunbridge Water* doth in some provoke the Menfes, in some stop them, so this Water might produce the Obstruction before named in a Person of a Sanguine Complexion on that account, which is a natural Effect of a *Plethora*; yet it must be allowed to be but answerable to the Quality of the Salt. *Epsam Salt* hath a Qualification of softness to penetrate farther than others without Obstruction, of the nature of Spirit of Nitre, and so can both incide and mellow what it meets with. The searching Quality of this Salt, I have known universally complain'd of, as raking and so heating by lean Persons, both Men and Women, but upon the same reason it is the most extraordinary Purge for grosser Bodies. To know rightly the Intentions these Salts satisfy, requires a good Understanding of the Nature of the Disease, which here cannot be insisted upon, only I shall give you one Instance in the Use of *Epsam Water* in Melancholy, whether natural Melancholy be not produced by the Formation of the Vessels and Complication, rather than by the nature of the Juices, I dispute not, nor how the Brain is concerned; The Disease effectively demonstrates it self to consist in the due Separation or discharge of

of the Excrements of the Body hindered, and through want of that Salt that should be separated with them to promote their Expulsion, whence their Spittle is fresh and stinking, their Body bound, and which is perhaps the Original of all this, the Blood allows not of a due Separation of Choler, and other parts that Nature alots to be amended. In all these Intentions *Epsam* Water or Salt recommends it self by its calcarious Salt, to advance the Heat and florid State of the Blood, and mix with it; by its Acidity to penetrate and incide, yet not of power to precipitate and harden; but above all by its Softness and Liquibility in Heat or Moisture, it is disposed not only to cleanse, but to render the Blood fluid and mellow, and leave the Vessels lax. And that I am right here, and not wide from Experience, it may be proper to inform the Reader, that I have known this Disease cured by this Water only, in those Persons who have taken the other Waters, as well as other Medicines, ineffectually.

And as Nitrous or Alkalifate Salts raise the Fermentation of the Blood, which is the same Effect which they have on Liquors, so Acids correct and suppress it: The Effect of one is ever discernable by flushing Heats, and the happy Effects they have in Malignant Fevers, and the power of the last in correcting the Heat of the Blood, and putting the Salt

in condition for a Discharge, is evident in the use of Acids, in those Feavers that are attended with Exanthemata. And this I mention, because in the Choice of a Purging Water for Prevention of Sickness as they are often drank, the Nature of the Feaver on foot ought to be consider'd. I wave that, and proceed to the Classes of the Waters, and their several Virtues.

The Waters agree in general to create or restore an Appetite, suppress Wind, and relieve Hypochondriacism. But the Virtues that result from their Specifick Nature, both from my Judgment and Experience in many of them, stand thus.

1. A Water containing a Salt, somewhat of the Nature of Salt of Chalk, but more resembling the Spirit than body of Nitre, and not corrosive. Of this kind is *Epsam*, whose Salt is unfigur'd or ungrain'd, and melts in the warmth of a hand. The Cases a Salt of this Nature is adequate to, are Melancholy, Cholicks and Cholical Pains in the Stomach, Obstructions of the Glands, and accordingly Heart-burning, Pains in the Sides, and any parts of the Body, if not too confirm'd; Scurvy, Vertigo; it cleanses gross Bodies, and safely lessens Fatness; relieves Redness of the Face; relaxes a costive Disposition; and

and cleanses the Kidneys, and perhaps in Ulcers of the Kidneys, or other parts, may fitly precede Chalybeats.

2. A Water more calcarious, and whose Salt is more of the Nature of the Nitre of the Earth than of the Spirit; such are *Atton*, *Barnet* and *Stretham* Waters, these I judge proper in the Stone, Gout, Diseases of the Lungs without Inflammation, and for Heart-burning; and where-ever the Intention of Sweetning the Blood is required, or raising the warmth and heat of it, this may be a suitable Purge; and are good in Melancholy, wherein *Atton* claims the next place to *Epsam*; They restore a good Colour to the Face, and remove or cure the falling away of the Flesh, and promote Fatning.

3. A Water whose Salt is Alkalifate, and resembles Salt of Tartar, and the Sulphurous Salts of Vegetables, though not perfectly; and as is *Upminster*, may be supposed to have the power of sweetning Acidities in remoter parts of the Body, strengthens the Stomach, checks Vomiting, and where Alkalies suit, is a good Diuretick, and is a proper Purge where the Body has a Disposition to Agues or Dropsies, only here the Salt is preferable to the Water, as it may be taken in a more proper Vehicle.

4. A

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The Waters agree in general to create or restore an Appetite, suppress Wind, and relieve Hypochondriacism. But the Virtues that result from their Specifick Nature, both from my Judgment and Experience in many of them, stand thus.

1. A Water containing a Salt, somewhat of the Nature of Salt of Chalk, but more resembling the Spirit than body of Nitre, and not corrosive. Of this kind is *Epsom*, whose Salt is unfigur'd or ungrain'd, and melts in the warmth of a hand. The Cases a Salt of this Nature is adequate to, are Melancholy, Cholicks and Cholical Pains in the Stomach, Obstructions of the Glands, and accordingly Heart-burning, Pains in the Sides, and any parts of the Body, if not too confirm'd, Scurvy, Vertigo; it cleanses gross Bodies, and safely lessens Fatness; relieves Redness of the Face; relaxes a costive Disposition; and

and cleanses the Kidneys, and perhaps in Ulcers of the Kidneys, or other parts, may fitly precede Chalybeats.

2. A Water more calcarious, and whose Salt is more of the Nature of the Nitre of the Earth than of the Spirit; such are *Acton*, *Barnet* and *Stretton* Waters, these I judge proper in the Stone, Gout, Diseases of the Lungs without Inflammation, and for Heart-burning; and where-ever the Intention of Sweetning the Blood is required, or raising the warmth and heat of it, this may be a suitable Purge; and are good in Melancholy, wherein *Acton* claims the next place to *Epsom*: They restore a good Colour to the Face, and remove or cure the falling away of the Flesh, and promote Fatning.

3. A Water whose Salt is Alkalifate, and resembles Salt of Tartar, and the Sulphurous Salts of Vegetables, though not perfectly; and as is *Upminster*, may be supposed to have the power of sweetning Acidities in remoter parts of the Body, strengthens the Stomach, checks Vomiting, and where Alkalies suit, is a good Diuretick, and is a proper Purge where the Body has a Disposition to Agues or Dropsies, only here the Salt is preferable to the Water, as it may be taken in a more proper Vehicle.

4. A

4. A Salt Alkalifate, with a very hard coagulating Acidity, namely, *Brentwood-weal*, hath the advantage of an Alkaly to sweeten the Blood, but with Astringtion, it increases flushing Heats, Scurfyness, and Leprous Humours, but is beneficial in any Fluxes through Coldness and Weakness, and to the Hypochondriacal, whose natural Temper is such; checks the *Catamenia*, and may be good to prevent Abortion, back'd with Chalybeats.

5. A Salt Alkalifate approaching a *Saltpetre*, is that of the Water of *Kensington*, the Virtues of an Alkaly appear before; as relating to *Saltpetre*, it may be more Diuretick, it tempers Choler, allays Thirst, suppresseth inflammatory and putrid Heat, and easeth Pain. The Earth contained in this Water, is so much in quantity, and the leafy hard parts so many, that I should think the Salt of this Water to be preferable to the Water it self. Or else the Water ought to be boyl'd till half be evaporated, and then depurated by suffering the grosser parts to subside.

All the Waters following partake of the Nature of a Vitrioline or common Salt, or Sea-salt, and so resist Putrifaction, make a strong Concoction, are proper in Worms, may cure a Jaundies when it comes upon a Colick, mortific Scabs, and remove Scurfyness,

ness, and kill several Humours, as Tetters and the like Eruptions; their particular Natures are as follow.

6. Waters which bear a Salt related to common Salt, but clear of the Muriatick part, are *Alford* in *Somersetshire*, and *Colchester*. To restore an Appetite, for Worms and mortifying Eruptions, and *Hypochondriack Flatus*.

7. A Salt more fully of the Nature of common or Sea salt, in its power of mortifying preternatural Salts in the Body, without the severity of coagulating, is found in *Lambeth Waters*, whereof the nearest Well is the most perfect. The Virtues see in the Examination of that Water. Only observe that these are used outwardly as well as inwardly.

8. A Salt of the Nature of that part of common Salt which Chrystallizes in the cold, is found in *North-Hall Water*, and may be beneficial in the Scurvy, beyond any others, as likewise in Rhumatisms, and in what cases soever that are attended with Putrefaction.

9. A Salt of the Nature of common or Sea-salt, yet not having an Acidity agreeing with Iron, but Fluxile, Penetrative and
Marca-

Marcaſitical, is that of *Dullwich*; it mortifieth Scabby Humours, and ſuch as are the Effects of Luxury, but promotes the Flux of the Menſes and Hæmorrhoids. Theſe require regular Drinking, work very much, and that churliſhly on thoſe that either Drinking or Walking hath put out of Temper.

10. Salt of the Nature of Salt of *English* Vitriol, that is of Iron, and ſeem a reſult of the uniting of Vitriol and Nitre, or Salt of common Earth, whoſe Characteriſtick is to give a white clouded Liquor with Gall, and not ſo high a colour with *Lignum Nephrisicum* as Alkalies give: This is the Salt of *Richmond* Water, and the two Chalybeats, and recommends the Uſe of theſe Waters, in the Cure of Scurfs, is moſt ſafe in Dropſies, in Ulcers in any part; in Hypochondriacal Caſes exceed the reſt: And the benefit of a Purging Water that is Chalybeat is extraordinary great, it not only answering the deſign of both Waters, but under the conſideration of a Purging Water, is made thereby ſpecifically proper in Aſthma's and beginning Dropſies, and without which Qualification, it could be adminiſtered neither ſo ſafely, nor with ſo good Effect.

According

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According to my Method before, I shall deliver the Virtues of the Chalybeat Purging Waters, from Observation of the Learned Dr. Witty at the Spring at Scarbrough, the happy Successes of which make him list it above all the Waters in Europe; he recommends in it these Qualities, *Crassos lentosque humores attenuat incassat, & dissolvit in Ventriculo, Mesenterio, Intestinis, Renibus & Vesicâ; diluendi item & detergendi virtutem nata, eos per Vesicam & intestina promptissime expellit, prout ab eorum positione videantur magis inclinari.* And presently names the *Vena lactea*, the *Porta* and Liver; and he makes a Remark at the Diuretick Quality, that notwithstanding two thirds presently run off by Urine, it purges so much, and at both in their lessening the bulk and weight of the Body. He enters his Observations with a Cure of a Scurvy, attended among other Symptoms with Pains in the Joynts, and difficulty of Breathing; and of a Gout in the same Gentleman, so considerable abated by it, that in a Letter he there acknowledges, he never after that suffered any Symptom of moment.

The Diseases further recorded by Dr. Witty to have been cured by the same Water, and of which he produceth instances, are, diverse Distempers of the Head, chiefly arising from
the

the consent of the Stomach and Hypochondries, Affections of the Nerves, and Spasm, vellicating the Coats and Nerves of the Stomach; or caused by Worms or sharp and bilious Humours. Pallies that from their accompanying Scurvy are called Scorbutick.

A Vertigo assaulting upon the least motion or heating of the Body.

A Vertigo with a Cold Sweat, intermitting Pulse, and Stiffness of the Neck remaining after the Cure of a *Spasmus Cynicus*, and which he judg'd to be Scorbutical.

A Spontaneous Weariness and Weakness of the Nerves, especially upon going forth in Cold Weather, remaining after the Cure of a Scorbutick Palsie, that at first had seiz'd the Patient upon a Journey, and taken away Reason, Sight, Strength and Motion.

An Epilepsie from a hot Vapour which the Patient felt to rise from the Hypochondries, and suddenly to strike his Head and Joynts, and which had frustrated many Remedies.

In Stoppages of the Breast he observed it to promote Expectorating, Spontaneous Weariness, and Difficulty or Shortness of Breath.

A Phthysical Asthma; that suffered not the Patient to lye down, or sleep, or keep his Food, and scarce allow'd him to drink,
mended

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mended in ten days time, and at last cured, so as to recover his Flesh, and vanquish the Symptoms.

An Obstinate Catarrh.

Gout, a Fit of which he freed himself from by drinking the Waters two days, as soon as he felt it certainly coming; in which too he practised Bathing in Salt Water, and Sweating upon it.

In morbis Ventriculi, Anorexia, Cardialgia, Eructatione perpetua, Nausea, & Singultu.

Hypochondriacism, with Pains of the Stomach after eating Flesh, Distention and Hardness of the Stomach and Torsions of his right side in one Patient; and with a joyn'd Pain of Back and Stomach, with a Schirrous Tension of the Ventricle and Liver, continual Disposition to Vomit, and a Jaundies supervening every Fit, in another Patient, who could not lye on the right side, nor bear the Region of the Liver to be touch'd.

Oppilations of the Mesentery, Liver and Spleen, preventing a Dropsie.

Another instance of its power in reducing the Belly after Child-birth, which remained Tumid.

Scurvy, Hypochondriack Melancholy, and Worms; Fluxes Dysenterick and Lienterick. Hot Intemper of the Kidneys, in wearing a new Stone, and expelling it with the Tartareous Matter. Also in a fresh *Lues*

Veneræ

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Venerica safely and quickly stopping a *Gonorrhoea*, and carrying off the Relicks, after the Cure of an old one.

In Morbis uterinis & Suffocatione Matricis, Chlorosi, Fluore albo Mensium fluxu inordinato. Abortionem praevertit & conceptionem promouet. And strengthens the Natural Parts.

I affix this Register exactly, because when so nicely done, is the only true way of adjusting their Virtues; and is so much the more useful, as it is equally applicable to *Scarborough* and *Woodham-Ferrys*, which are both the same.

Rule of Drinking these Waters in general, is the same which the Chalybeats require, viz. Chearfulness and Exercise, and a mild Diet, they are not to be slept upon without danger, nor doth the benefit of them consist with a Temper disordered by Drinking, either in the use of them; or immediately before.

The Repetition of drinking Purging Waters three or four times, sufficiently answers the general Design of washing the Body, though the more stubborn disorders of some Bodies, make a longer use of them necessary. But when the Nature of the Distemper, or its Obstinacy, require the use of them specifically;

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hically, they ought to be continued as other Remedies for many Weeks, though with Intermissions at Discretion.

The Use of the Salts of the Purging Waters is very advantageous for Persons that are distanced from them, and in the Winter, especially in cases wherein the Milk, which is usually added to make them agreeable by turning them into Posset clarified, is not allowable, as in Itches and Salt Eruptions. The Use of which both in Glysters and Purges, when dissolved in Water, or convenient Apozems, is most kindly, and may be properly applied, as the Learned Dr. Grew hath introduced it.

N

Some

*Some Observations on the Bath Water in
Somersetshire.*

THE smallness of the Quantity of the Bath Water, which I could procure at so great a distance, did not allow me Scope to try the earthy and Saline parts collectible by Evaporation. The Water was clear, and coldish to taste, not wide of the taste of common Water. It did not gild Silver, or make it yellow, as it doth at the Spring. I could discover little Alkalifate in it: It thickned and became milky with Oyl of Tartar and curdled: It did not precipitate Sublimate dissolved in common Water considerably, which upon standing some time became only a very little whitish. The Salt contained in this Water, appeared fully to be *Salpetre*, in that it did not the least disturb a Solution of *Sal Saturni* in fair Water; but shewed a little of the Nature of common Salt more than *Salpetre* bath, in giving a pale yellow with *Lignum Nephriticum* with a dark cloud which settled; and in taking a dull Ale colour, not fine with Tincture of Logwood, the red it took languish'd more and more: And in precipitating a Solution of fine Silver out of Spirit of Nitre in a hardish Cord, more than *Salpetre* doth.

Those

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Those that know the Nature of both Salt-petre and Sulphur, which are the Principles that impregnate this Water, must allow them to be produced by the heat of the Earth, and not to be the cause of it. If we enquire into the Cause and Original of this Heat, the Nature of the Salt evidenceth it not to be produced by any calcarious Quarry, nor the Effervescence of contrary Salts and Acids: Subterranean Fire is groundless, and hath invincible Absurdities; it may reasonably be supposed to be maintained by the Heat of the Earth; for as a considerable Heat is required to the Concoction and Preparation of Metals, and is sensibly proved in the Mine-chambers; so that Crust of dead loamy Earth that assists to maintain it, separates it from us, and though we find no such extraordinary Heat, yet the Heat of the Mines do not only prove a Heat, but imply a much greater to be where the Metal is prepared, than where it is separated. The Eruption of it at places, I pretend not to account for, but that it is different often in places not many Rods distant, is beyond doubt.

The Virtues of these Minerals well account for the Cures wrought by the *Barb*, the most which I have observed or known, having been in Tumours or Palsies from tough Phlegm; not to take notice of their exter-

nal Use in Scabby Diseases: And those that have been within my knowledge, have been all performed by Pumping the diseasy part, and not by Bathing. Now the Qualities that Authors take notice of in Sulphur to heat and dry, incide, open and provoke, Sweat, and resist Putrefaction, consider'd with the power of the other to ease Pain, penetrate, discuss, and temper Inflammation, sufficeth to the performing all this. But to bring it nearer to sense, I shall take notice what any Person may prove, that a Bath made of Saltpetre, Sea-salt and Brimstone, is the most happy Dissolvent of Oedematous Tumours even in the Legs, that hitherto I have observed. It is much to be suspected, that this Water must lose much of its power, if not the best part, by carriage, together with its power of Tinging Silver yellow, especially for inward use.

I shall conclude all with this useful Remark, That as the Waters are a powerful and extraordinary Remedy, so to have success in the use of them, it is necessary to form just and due Observations of them, by distinguishing,

1. What Cures are wrought by the Waters on a general Account, and what by the Nature of the distinct Salt.

2. What

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2. What are proper and may effect in light Cases, but seldom avail alone.

3. Some that avail, but fail in confirm'd Cases, as the Purging Chalybeats in Hypochondriacism.

4. What Distempers they Cure, with regard to a particular cause, and not universally.

And lastly, What they may be trusted to for, as in inveterate and confirm'd Obstructions. The light Chalybeat Waters may, and perhaps in Asthma and Scurvy the Purging Chalybeats, &c.

Some

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Some

Some Observations on the Water of Queen
Camel in Somersetshire.

THE Trial of this Water I annex to the Bath Water, because this is likewise a Sulphurous one and might illustrate that ; at least having it by me I thought worth preserving. It is a cold Spring of a fœtid smell, in which, as well as in Taste, it resembled that of a foul Gun, as my honoured Friend the Reverend Mr. Samuel Adamsen, who made the Experiments for me at the Spring, inform'd me. It tingeth the stones black on which it falls. The use of this Water is inwardly and outwardly in the Kings-Evil, and other Ulcers and Scabbiness, in which the success is frequent, and purgeth little of any thing, but hath produced Eruptions if drank without occasion, by a Body whose Constitution they disagreed with. It hath the Reputation of proceeding from a Copper Mine, for which my Friend could discover no ground, as neither do the Trials, unless some *Pyrites* there found may give the occasion.

This Water prov'd upon Tryal to contain a Calcarious Salt, yet not so open as to answer with Gall and *Lignum Nephrcticum*, and a Sulphur differing from common Brimstone, and more amicable to Alkalys, and not to be precipitated by Acids ; and to contain no Meralline parts, at least openly so.

With

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With Gall it took a very pale Yellow, and upon standing a Week a little deeper colour, and a little thicker.

With *Lignum Nephriticum*, upon 12 hours standing, a little deeper than with Gall; in both which it resembled neither Vitriols, which take less colour, nor as Alkalys, which give a deeper, but nearer *Saltpetre*, or rather common Pump-water.

Like Alkalys it curdled not Milk.

With a Solution of Sublimate, 15 drops in 4 ounces, a bright brass colour, and upon addition of 5 drops more, curdled and precipitated of a *Fenille more* colour, as Alkalys and Salt of Lime.

Oyl of Tartar *p. del.* 75 drops in 4 ounces, made it more limpid and inclinable to a bright Copper, which Vinegar would not precipitate.

The Water, when it had stood a Week, with a Solution of *Sal Saturni*, turn'd White like Milk as Alkalys, but when fresh, with 10 drops of the Solution, took a dark brown colour, and look'd thick.

The Sediment, which is small and dark colour'd, would not burn, nor would it communicate a Colour to *Aqua fortis*, nor to common Salt upon standing, as Mettals and Copper especially will.

For various Reasons I must excuse any inimical Mineral from a share in this, especially Arsenick or Copper, but judge it rather near

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to common Sulphur, but less remote from an Alkaly: But to know this more nicely, the *Pyrites* ought to be prov'd.

As this may shew the reason of its good Effects in the King's-Evil, and why it agrees not in a Scorbutick Disposition, so it may help to direct its proper place in Acid Tumors, as Milk Sores, or where the Chyle is curdled, which if observ'd, might make the Waters more useful.

This Water gilds Silver as doth the Bath Water, and as doth common Sulphur.

The Figure of the *Scarborew* Water Salt re-
ferr'd to at Page 155.

The Figure sent me and there re-
ferr'd to.



The Figure of the Salt sent me.



F I N I S.

A Second Essay of the Bath Water.

HAVING some reason to be dissatisfied with the former Essay of it, I procur'd some more new: I found the Taste a very little Nauseous and Saline. The Salt of it resembled Common Salt, the Water not disturbing a Solution of German Vitriol: nor a Solution of Sublimat, and taking but a pale dull red with Syrup of Cloves, and very little Colour from *Lignum Nephriticum*, and with Gall pale and curdled. With a Solution of Salt of Lead it curdled strongly, but Whitened not the Liquor so much as Pump Water. Besides this strong Precipitation it had this peculiar, not to præcipitate Silver, so readily or so much as common Salt: And it made a White curdle with Spirit of Harts-horn, but did not disturb Spirit of *Sal Armoniac*: This differing Effect, of these two Spirits, is only found in a Decoction of common Salt and common Sulphur, and Sulphurous Bodies; for I observed near the same, to succeed with an Infusion of Orpiment and Spirit of Vitriol diluted. This odd Phænomenon is in *Dulwich* Water, which hereby is illustrated to be owing to the Sulphurousness of the *Pyrites*, and perhaps depth of the Water.



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